D9.8 – Summer School

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Deliverable Information

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Contributors	
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PU	Public	✓
PP	Restricted to other programme participants (incl. Commission Services)	
RE	Restricted to a group specified by the consortium (incl. Commission Services)	
CO	Confidential, only for the members of the consortium (incl. Commission Services)	

Document Log

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V1.0	04/07/2022	First draft
V2.0	18/07/2022	Final version

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1 EXECUTIVE SUMMARY

This deliverable reports the achievements reached with the organization of the SINTEC Summer School, entitled: “Smart Bioelectronic and Wearable Systems”, a public event which aimed to show the novelties SINTEC project will bring to the Wearable sensors sector and networking with companies and other European funded projects to discover future opportunities in the stretchable electronics market.

SINTEC Summer School gave the opportunity to disseminate the project progress to post-graduates, early-stage & senior researchers, professionals, and technicians from industries of the involved institutions within the consortium (both academia and enterprises) and open to participants coming from outside of the project and joining the school from all over Europe.

The class topics covered mainly PCB technology and how it can be turned into a stretchable smart patch, how the involved sensor can communicate with the latest IoT technologies and why this innovative research can be useful for healthcare and sport monitoring.

2 INTRODUCTION

SINTEC is currently working on the making of new smart patches. These patches are made of soft stretchable circuit board technology and can measure important body functions that are wirelessly transferred to a smartphone. The researchers hope that the patches can be used in health and sports. In SINTEC, eight partners collaborate in developing a technology for stretchable electronic patches.

The smart patches are developed by a circuit board technology where small modules of common electronic components are mounted in a soft rubber material and connected with fluid alloy conductor tracks. The patches can measure important body functions and wirelessly gather the information to a smartphone with a safe, fast and streamlined transmission via the fat tissue in our body. Instead of sending signals into the air with an antenna, we aim it toward the body. This reduces the power needed for communication and the information cannot be read without coming into direct contact with the person's skin.

The SINTEC Summer School has set itself the goal of showing professionals, students and engineers the work done during these years of design, showing and touching the developed smart patch prototype at the same time. In addition to the presentation of the prototype, another objective involved various field activities aimed at testing the device.

3 GENERAL INFORMATION

3.1 Title

SINTEC Summer School on Smart Bioelectronic and Wearable Systems.

3.2 Date

The 4-day School was organized from Tuesday, 7th June 2022 to Friday, 10th June 2022.

3.3 Location

The SINTEC Summer School was organized in Castione della Presolana and more precisely at the conference centre of the Grand Hotel Presolana. The practical activities and tests on the device were instead conducted at high altitude, in the mountains surrounding Castione della Presolana, a few kilometres from Bergamo, Italy.

Figure 1: SINTEC Summer School location

3.4 Organizers and Contributors

The organization of the event, arrangements, and management has been carried out by Warrant Hub. Warrant Hub was in charge of the communication activity before and during the event: it took charge of preparing school printed material, it managed the online registration process, the internal communication among students, speakers and stakeholders, and it moderated the event. WARRANT HUB, supported by UU, planned the scientific program, inviting speakers, experts and the coordinators of other H2020 funded projects to join the event. Moreover, WARRANT HUB organized everyday some social activities to improve networking and team building among the participants.

Figure 2: SINTEC Summer School organizers

SINTEC partners contributed to the definition of the scientific agenda, giving their availability to present the work done inside the project and the main results achieved. The SINTEC Summer School was co-organized by the projects WELMO, SOCKET SENSE and LIFE CHAMPS that contributed to the event with presentation about their project's results.

3.5 Language

The presentations were performed in English.

3.6 Target audience

The SINTEC Summer School has been mainly addressed to:

- Phd and Postdoc Students
- Early-Stage Researchers
- Industry Practitioners

3.7 Registration procedures

Registration was mandatory to attend the school. WARRANT HUB managed the registration process through a registration form available on the project website, and it supported participants in case of any problem with registration process or in case of information needed.

Participants were asked to provide information about:

- Personal data
- the arrival and departure date and hour
- any dietary constraint
- short CV pointing out background and research activities - Participation to the school was subjected to the approval of the Organizing Committee.

Participation to the school in-person included:

- Pre-Booking of a room (full board) at a discounted rate: the room was paid by each participant directly at the hotel
- Transfer from/to the hotel
- Coffee breaks
- Lunch breaks
- Gala Dinner
- Free Wi-Fi
- Guided tours
- Practical activities
- School material

Participation to the school in-person did not include:

- Any other travel costs not mentioned
- Extra drinks

Registration for school participation closed on 20th May 2022; **55 registrations** were approved. Participation was free of charge.

4 SINTEC SCHOOL DESCRIPTION

4.1 School Program

The SINTEC Summer School unfolded over four days of intense activities both on a purely theoretical and practical level. In fact, in addition to the spaces dedicated every day to the speakers and the description of both the project and the activities carried out in it, preparatory outdoor activities were conducted especially for the realization of some experimental tests for the prototype developed by the SINTEC project. Every day was dedicated to a specific topic:

- Day 1: From PCB and Printing Technology to Smart Bioelectronics and Wearables
- Day 2: Smart Bioelectronics and Wearables for Sport Monitoring
- Day 3: Smart Bioelectronics and Wearables for Monitoring Health Parameters
- Day 4: General Applications and Perspectives in Smart Bioelectronics and Wearables

Together with this, a welcome kit was also delivered to all participants including a SINTEC branded backpack, a detailed paper program of the Summer School, a pen for notes and a rain cape.

Figure 3: Partners preparing practical activities

Day 1 opened at 14:00 after the arrival of all the participants and a presentation speech was opened by **Sara Attanà** (Warrant Hub), organizer of the event. Her opening had the aim of welcoming all the participants, describing her role and the role of her company, Warrant Hub, in the project and in the organization of the event. Sara introduced the programme of the days, highlighting the importance of networking and asking questions for the good result of the school. She also anticipated that, at the end of the event, students would receive an evaluation test to fill in to receive some University credits.

Immediately afterwards, a quick round table presentation was set up with the aim of showing specifically to all the participants the theoretical and practical activities that would be undertaken that day and the days to come, as well as obviously providing all the basic information necessary to orient themselves both within the accommodation and its surroundings.

Subsequently, the Coordinator of the SINTEC project, **Klas Hjort** of the University of Uppsala, presented the general characteristics of the project and gave his personal welcome to all those who have chosen to participate in the Summer School. After Professor Hjort it was then the turn of **Gustaf Mårtensson** (Mycronic) with a presentation entitled: "Printing and PCB technology for flexible and stretchable patches". After him there was a short coffee break and then the intervention of **Hashim Quraishi** (Evalan) who presented "IoT solutions and communication between devices". Then **Alessandro Gumiero** (STMicroelectronics) took the microphone with a presentation entitled: "Sensor Technology for Health and Wellbeing".

Later there was space for an open discussion and for further questions from the participants towards the speakers before the closing of the works of the first day.

Figure 4: Registration procedures

Figure 5: SINTEC Summer School - DAY 1

The second day of activities opened with a pleasant trekking experience. At 8:00 am the participants were invited to a rendezvous in the conference room in order to prepare for the climb of Monte Pora and Monte Alto to their summit (1,723 meters above sea level) from which it was possible to admire the splendid Lake Iseo below. The activity was particularly stimulating thanks to the participation of some alpine guides who gave numerous explanations to the participants on the alpine mountain ecosystem, on the species of plants and animals present as well as information of a physical and geological nature of the place. Before leaving, people were divided in small groups to test, in different body areas, the SINTEC smart patch during the trekking activity. After a lunch at a typical mountain refuge, the group resumed their journey to return to the conference room, where activities started at 3:00 pm. The topic of the day was **Smart Bioelectronics and Wearables for Sport Monitoring**. After an introduction of the day given by **Sara Attanà** (Warrant Hub), **Matej Supej** (University of Ljubljana) and **Hans-Christer Holmberg** (Luleå University of Technology) took the floor with a presentation entitled: "Wearable technologies in winter sports: Physiology and Biomechanics ". After them, **Nina Verdel** (Mid Sweden University and University of Ljubljana) took the floor with a speech on the theme "Wearable technology in summer sports", after which the activities were interrupted for a short coffee break and a poster session; an invited speaker from University of Verona, **Barbara Pellegrini**, continued with a presentation entitled "Challenges to perform measurements in the laboratory vs. the field: state of the art and perspectives". After her, **Mauricio Pérez** (Uppsala University) intervened to talk about "Fat-IBC: A new paradigm in Body-Area Communication". During this second day, participants had the occasion of present their works: a poster session was organized in the conference room to give them the opportunity to show their research activity to the rest of the audience. At the end of the day, SINTEC Coordinator, **Klas Hjort**, kicked off the open discussion before the closing of the activities and the dinner at the hotel.

Figure 6: Networking activity at Ponte Pora


Figure 7: SINTEC Summer School - DAY 2

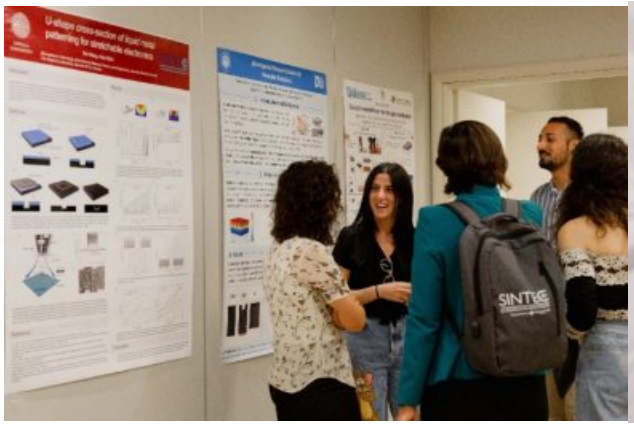



Figure 8: Poster session

The third day of the SINTEC Summer School opened at 8:30 am and saw a further activity aimed at creating links between the participants and improving networking. This time the group proceeded to trek at the Predusolo natural park, a coniferous forests located around Castione della Presolana, and even on this occasion some prototypes of the device SINTEC is developing were tested. The group was guided by two alpine guides and an athletic trainer that organized the activity alternating trekking activity with description of the natural environment and sport activity.

Afternoon session started at 14:00. This third day was dedicated to **Smart Bioelectronics and Wearables for Monitoring Health Parameters** and included presentation of results reached in Horizon 2020 projects funded in the same call of SINTEC and projects that are developing smart technology for health. **Sara Attanà** (Warrant Hub) opened the day presenting **Antonis Billis** (Aristotle University of Thessaloniki)**,** Project Coordinator of LifeChamps project, who gave a speech entitled "LifeChamps sensing platform and digital biomarkers for monitoring QoL of older cancer survivors". The event continued with the presentation by **Guido Pagana** (LINKS Foundation) on "Smart patches and Wearables for clinical applications": this speech gave an overview of the usage of smart patches for patients monitoring, explaining the benefits of a technology like SINTEC. Afterwards a quick coffee break and the student's poster session, SocketSense project was presented: **Pouyan Mehryar** (Teesside University) had a speech entitled "Clinical trials for socket comfort analysis and constructing biomechanical models for sensor deployment", an intervention particularly appreciated by the

participants. Then, SocketSense Project Coordinator, **Dejiu Chen** (KTH), reported on "Analyzing dynamic operational conditions with sensors and models for anomaly detection". Last presentation of the day was WELMO project presentation: Project Coordinator **Alexis Melitsiotis** (EXODUS) and **Nikolaos Beredimas** (Aristotle University of Thessaloniki) gave a speech entitled "Effective monitoring of lung activity in lung related chronic diseases patients utilizing sound and visual signals in a comfortable wearable setting". Subsequently, the open discussion took place before the end of the lessons. At the end of the third day, a gala dinner was organized for all the participants.

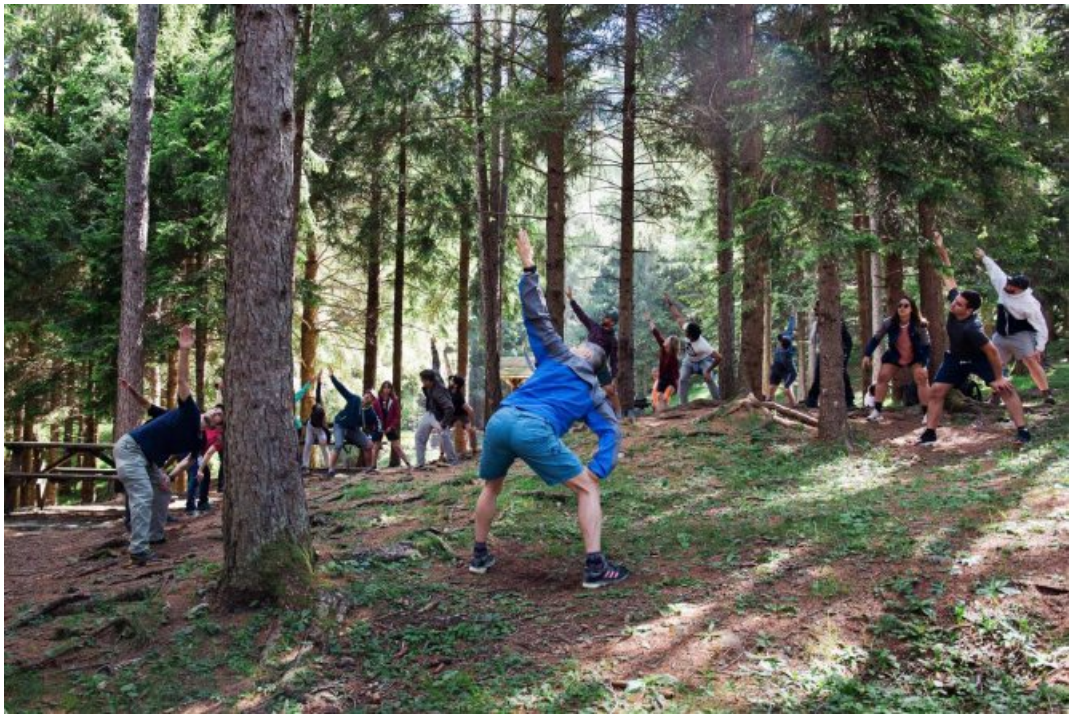


Figure 9: Trekking to Predusolo natural park

Figure 10: SINTEC Summer School participants at Predusolo Natural Park

Figure 11: SINTEC Summer School - DAY 3

The fourth and last day of the SINTEC Summer School was dedicated to the General Applications and Perspectives in Smart Bioelectronics and Wearables: the idea of this last day was to open the dialogue about smart wearables also with other sector outside health and sport monitoring, trying to understand the potentiality of the sector and outlining the future perspective of application. **Sara Attanà** (Warrant Hub) opened the day presenting the different invited speakers that alternated during the day. The session started with a workshop organized by the project WELMO regarding non-invasive chest imaging and sound analysis of lung activity validated in 2 clinical studies which were attended by: **Josias Wacker** (CSEM), **Rita Paradiso** (SMARTEX), **Nikolaos Beredimas** (Aristotle University of Thessaloniki) **Bruno Rocha**, **Diogo Pessoa** (University of Coimbra) and **Inez Frerichs** (Kiel University). The workshop presented the results achieved in the project, showing also how the WELMO prototype worked. The day continued with a round table to discuss about potential exploitable results and commercial perspectives: the session was chaired by the SINTEC exploitation Manager, **Sergio Guillen** (MySphera), who involved some of the invited speakers to better understand the main characteristics new wearable sensors need to have to go on the market and beating the competitors. The people interviewed during the round table were **Emilio Vanoli**, Associate Professor of Cardiology at University of Pavia, **Danilo Demarchi**, Full Professor at the Department of Electronics and Telecommunications of Politecnico di Torino, **Klas Hjort**, Head of the Microsystem Technology programme at Uppsala University and SINTEC Project Coordinator, **Rita Paradiso**, CEO of the company SMARTEX, **Sara Casaccia**, Assistant Professor of Mechanical and Thermal Measurements at the Department of Industrial Engineering and Mathematical Sciences of Università Politecnica delle Marche, **Marta Tessarolo**, Senior Researcher on wearable textile biosensors based on polymer semiconductors.

After the round table it was time for the poster session; later some invited speakers showed potential application of wearable sensors in different sectors. **Sara Casaccia** (Polytechnic University of Marche) presented "Using wearables and Artificial Intelligence to measure personal comfort in living environments": her presentation focused on sensors and measurement techniques for supporting people in build and living environments (e.g. comfort, wellbeing), data processing to extract complex information (e.g. using AI), sensors for biomedical applications and non-destructing techniques. After her presentation, another interesting presentation took place: **Antonio Del Mastro** (Mars Planet Italia) and **Filippo Servalli** (Radici InNova) reported on "Wearable prototype for space and industrial applications "showing how the applications of projects such as SINTEC can be extremely interesting also in the aerospace field. **Marta Tessarolo** (University of Bologna) finally closed the cycle of presentations with the speech entitled "Smart Bandage with textile organic biosensors for wearable healthcare".

The day closed officially with a graduation ceremony: **Isella Vicini** and **Sara Attanà** (Warrant Hub) gave the certificate of participation to all the students that joined the event.

Figure 12: WELMO workshop at SINTEC Summer School

Figure 13: SINTEC Summer School round table

Figure 14: SINTEC Summer School invited speakers

Figure 15: SINTEC Summer School Graduation

4.2 Speakers

The school involved both academic and industrial partners of SINTEC project as well as external invited speakers.

4.2.1 Internal speakers

- **Klas Hjort (Uppsala University)**: Prof. Hjort is experienced in advanced microengineering. Recently, his focus has been heterogeneous microsystems on stainless steel, flexible foils and elastic substrates; for biomedicine and wireless sensor and actuator nodes. He is co-ordinator of the H2020 projects SINTEC on soft and stretchable printed circuit boards for wireless smart patches and SOMIRO on autonomous swimming soft micro robots that only require energy from the sun.
- **Isella Vicini (Warrant Hub)**: Isella Vicini is the Director of the European Funding Development of Warrant Hub S.p.A and the CEO and founder of beWarrant, a Belgian consultancy company that provides support on European Funding opportunities. She has a wide experience in the EC Research and Innovation programmes, like Horizon 2020 and LIFE Programme. Since the First Framework Program (1985), she works in the European Project Design field, taking care of the complete cycle of a project: from the analysis of the sectorial policies to the conclusion of the research and innovation project. She currently manages a team of 16 people and her European Funding Development provides 80 consultancy services per year, it is involved in 51 projects and it manages 151 million euros Horizon 2020 grant. Isella is the Project Coordinator of the EU funded project Repair3D and the founder and Dissemination Manager of ECHOES, the EC Cluster on Cultural Heritage.
- **Sara Attanà (Warrant Hub)**: Sara Attanà is Dissemination Specialist at the Business Unit European Funding Development of Warrant Hub S.p.A. After a BSc in Communication Science and a Master in Business Management, she has been Marketing and Communications Assistant for Cesari srl and Web Designer, Social Media Manager and SEO Specialist for the IT company ITquadro srl. Since 2017, she is Dissemination and Communication Consultant, Web Designer and Graphic Designer in Warrant Hub. She's currently involved in the dissemination and communication of more than 50 H2020 and LIFE projects; her activity includes the development of project websites, organization of events and trainings, social media management, graphic design, and EU project reporting. She's the winner of the 2020 .eu web awards for SINTEC project website.

- **Gustaf Mårtensson (Mycronic)**: Gustaf has a M.Sc. in Engineering Physics from the Royal Institute of Technology (KTH) in Stockholm, Sweden. He continued his studies in the realm of fluid mechanics and received his Ph.D. in 2006 from KTH. Gustaf divides his time between rolls as an Expert of Complex Fluids at Mycronic AB and an affiliated researcher at the School of Chemistry, Biotechnology and Health at the Royal Institute of Technology in Sweden.
- **Hashim Quraishi (Evalan)**: Hashim Quraishi has a passion for designing solutions to improve the user's quality of life. He has previously combined his background in mechanical and biomedical engineer to design various mechanisms and medical products such as exoskeletons and prosthetics. Currently he is active as a firmware engineer with a primary focus on the Internet of Things.
- **Alessandro Gumiero (STMicroelectronics)**: Alessandro Gumiero was born in Moncalieri, Italy in 1985 and received the degree in Electronic Engineering from Politecnico of Turin, Italy in 2011. During the last year of his studies, he joined the SRA laboratory of STMicroelectronics, where he developed his skills in electronic design and acquired new expertise in the analysis of biological signals. His research focused on the detection of the PhotoPlethysmoGraphy (PPG) signal on the wrist in motion condition, both with traditional techniques and, recently, with more innovative sensors, like single photon avalanche diodes (SPADs) and SPAD cameras. Currently, he is, within the SRA Remote Monitoring Team, the responsible of the electronic and mechanical part and co-responsible of the algorithm part for the development of innovative patches for ECG and BIO signals monitoring. He also explored electroencephalography (EEG) acquisition and processing through wireless, high density, multichannel devices. He collaborates, in his research activities, with academic and industrial partners, also in the context of national and international funded projects. He is inventor of 1 granted patent and (co-)inventor of other 2 patented application. His research is always oriented to promote and simplify the usage of medical instrumentation to enable a reliable BIO signals remote monitoring and improve the quality of life of the people reducing at the same time the cost of the public facilities.
- **Matej Supej (University of Ljubljana)**: Dr. Matej Supej is a professor of Sport Science-Kinesiology, head of the Laboratory of Biomechanics and head of the research programme at the Faculty of Sport, University of Ljubljana, Slovenia. He is also a guest professor at the Department of Health Sciences at Mid-Sweden University. He has an interdisciplinary background with a B.Sc. in Physics, an M.Sc. in Mechanical Engineering, and a Ph.D. in Sport Sciences. He is a former elite alpine skier, a member of the National Alpine Ski Team and Demo Team, and currently a member of the Technical Advisory Board of the Slovenian Ski Association. His research, which has been recognized with two national awards for scientific excellence, an international innovation award, ~100 scientific papers, several invited lectures and presentations, focuses mainly on the biomechanics of human movement, advances in wearable technologies and other measurement technologies, especially for optimizing sports performance, sports equipment and reducing the risk of injury.
- **Hans-Christer Holmberg (Luleå University of Technology)**: Hans-Christer Holmberg is Professor at Luleå University of Technology. He is also affiliated with Karolinska Institute in Stockholm, Sweden, and the University of British Columbia in Vancouver, Canada, as a senior researcher. He founded the Swedish Winter Sports Research Centre in 2006 and acted thereafter as its director until 2015. Holmberg's research focuses primarily on cross-country and alpine skiing, using integrated physiological and biomechanical characterization, both in the laboratory and field, to elucidate mechanisms and improve performance. His multiple disciplines of interest within physiology include muscle function, circulation, respiration, and metabolism, while his biomechanical approaches include kinetics, kinematics, and electromyography, with special emphasis on novel technology. He has also carried out research on other sporting disciplines (e.g., cycling, running, swimming, orienteering, soccer) and his present total of more than 220 publications in peer-reviewed scientific

journals, in addition to several book chapters, includes a growing number on physical activity and health, as well as on the utilization of wearable sensor technology. Dr. Holmberg is also Director for Research & Development at the Swedish Olympic Committee (2005-present).

- **Nina Verdel (Mid Sweden University and University of Ljubljana)**: Nina Verdel is employed at the Mid Sweden University and the Faculty of Sports, University of Ljubljana, Slovenia. Within the SINTEC (Horizon) project, she is working at Mid Sweden University on the development and validation of a new sensor - SINTEC smart patch (biomechanical and physiological parameters). At the Faculty of Sport, she is doing research in the field of biomechanics.
- **Mauricio Pérez (Uppsala University)**: Dr. Mauricio Pérez was born in Buenos Aires, Argentina, on 25 July 1980. He received the engineering degree in Electronics from the National Technological University (UTN) in Argentina in 2007. He obtained the PhD in Electrical Engineering at University of Bologna (UNIBO) in Italy in 2012. He had experiences in the industry as a researcher in Italy from 2012 to 2014 and from 2014 he is a collaborator with National Technological University (UTN) of Argentina in teaching and research. Currently, he is a researcher at the Microwaves in Medical Engineering Group at Engineering Sciences Department of Uppsala University (UU) in Sweden. His research interests are microwave passive technologies and advanced applied mathematics for biomedical applications.
- **Guido Pagana (LINKS Foundation)**: Dr. MD Ing. Guido Pagana received the degree in Engineering from Politecnico di Torino and Paris Supelec in 2000 and in MD from University of Torino in 2006, Ph.D. in Electronics Engineering in 2009 on microwave imaging for breast cancer detection. He is both engineer and medical doctor collaborating with hospitals in Torino area. He joined the Department of Control and Computer Engineering as Research Engineer working on algorithms for biomedical data analysis. His research field covers elderly medicine, telemedicine, telemonitoring, analysis of cardiological signal and microwave imaging. Since 2003, he has worked as a researcher at Links Foundation in Torino.
- **Sergio Guillen (MySphera)**: Graduate in Electronic Engineering (1976) and Doctor of Telecommunications (Polytechnic University in Valencia, UPV, 1988). He has worked for more than 10 years as Research Fellow of the National Scientific Council (CONICET) of Argentina and as Assistant Professor in the University of Tucumán (Argentina) in the field of Biomedical Engineering and Medical Instrumentation. Since the beginning of his professional career he as combined both, academic and research activities and entrepreneurial undertakings. In 1998, he created the TSB Research Group, "Tecnologías para la Salud y el Bienestar" at the UPV. In 2000, he co-founded the ITACA Research Centre within the UPV where the TSB Research Group is currently ascribed. He has participated in more than 20 V, VI and VII Framework Programme R&D projects in the e-Health and e-Inclusion fields. Worth to mention are PIPS (IP VI FP project), My HEART (IP VI FP project) and SENSATION (IP VI FP Project). He has been technical coordinator of the PERSONA (IST- VI FP project) and Technical Manager of universAAL (IP VII project). He has been member of the management board in HEART CYCLE, OASIS, METABO and VAALID (all VII FP projects) as well as member of the advisory board in Heartways (Research for SMEs - VII FP Project) and MOSAIC (ICT – VII FP project). Currently he is Deputy Project Coordinator of H2020 LSP ACTIVAGE. He is Chief Innovation Officer of MYSPHERA.

4.2.2 Invited speakers

- **Barbara Pellegrini (University of Verona)**: Barbara Pellegrini is currently associate Professor of Sport Science at the University of Verona, and teaching by the Master's degree in Sports Science and Physical Performance, University of Verona and Trento, Italy. She earned her Master Degree In Physics at University of Trento in 1999, and her PhD in Physical Exercise and Human Movement

Science from the University of Verona in 2012. She is in the Department of Neuroscience, Biomedicine and Movement Science, and her research activity is mainly carried out in the laboratories of CeRiSM, Research Center for Mountain Sports and Health, of the University of Verona. Her main research interests are in the field of biomechanics and physiology of sport, human exercise and locomotion in the field of endurance sport, with a special focus on cross country skiing. She has conducted several projects by collaborating also with international groups with the aim to deepen the knowledge of the biomechanics and energy of cross-country skiing. Her research interests include Nordic Walking. From 2005 to now she is involved in the evaluation test of the Italian Cross country ski teams. From 2010 to now, she is involved in collaborations with sports companies, in projects aimed at testing sports garments and equipment for sports.

- **Pouyan Mehryar (Teesside University)**: Pouyan Mehryar is currently a Postdoctoral Researcher in Artificial Intelligence at the Healthcare Innovation Centre (HIC) of Teesside University based in The Welding Institute, Cambridge/UK. He obtained his Master of Engineering (MEng) with first-class honours (within-top 1%) in Mechanical and Medical Engineering from the University of Hull, UK. He received his PhD degree from the institute of Design, Robotics and Optimisation (iDRO), School of Mechanical Engineering at the University of Leeds, UK, in 2018. After obtaining his PhD, he became a Postdoctoral Research Fellow in iDRO working on the Development of Intelligent Control for a Wearable Soft Robotic System. Following that, he was appointed as a Postdoctoral Teaching Fellow responsible for teaching Biomechatronics and Medical Robotics to master students, which mainly involved the use of Artificial Intelligence (i.e., machine learnings techniques) in robotic applications. Pouyan Mehryar also worked on different Innovate UK projects, which involved Quick fitting of prosthetic sockets for above-knee amputees (QuickFit), the development of a prototype wheelchair system that uses internet of thing (IoT) biophysical sensors for AI healthcare monitoring to support the independence of elderly patients (iChair) and AI-based solution for the detection and characterisation of lesions in breast MRI (Intelliscan) as a postdoctoral research associate at the HIC, UK. His research interests lie in the areas of Biomechanics, Clinical Movement Analysis, Neuro-Engineering, Assistive and Rehabilitative Robotics, Artificial Intelligence, Multibody Dynamics and Biostatistics.
- **Dejiu Chen (KTH Royal Institute of Technology)**: Dejiu Chen is a Docent and Associate Professor in Embedded Control Systems, with the Mechatronics and Embedded Control Systems Division and Digital Futures Faculty, of KTH Royal Institute of Technology, Sweden. His research interests are in the areas of embedded control systems (ECS), cyberphysical systems (CPS), and system-of-systems (SoS), with active research on: 1. Engineering methods and tools; 2. Architecture design and system integration; 3. Safety engineering for trustworthiness; and 4. Design of self-X properties for anomaly treatment and operation optimization. He has worked for Enea Data AB, Sweden, as a senior technical instructor during 2007~2009. Dejiu Chen is currently the PI for EU H2020 research project SocketSense on AI centric medical IoT, and the KTH PI for EUREKA EURIPIDES2 research project TRUST-E on the reliability of AI platforms. Dejiu Chen is a senior member of IEEE.
- **Alexis Melitsiotis (EXODUS)**: Alexis Melitsiotis is an R&D Project Manager and a Physicist graduate from the Physics Department of University of Crete. He completed his Postgraduate studies in “Physics and Technological applications” in 2015 at the National Technical University of Athens and his dissertation was related with the magnetotransport properties of multilayered thin films. In 2014 he joined the INN of NCSR Demokritos as a junior researcher and since then he has participated in 7 European, industrial oriented Research projects (FP7 & Horizon2020) for Research Centres and SMEs.
- **Nikolaos Beredimas (Aristotle University of Thessaloniki)**: Nikolaos Beredimas has been involved in national and international eHealth research projects in the Aristotle University of Thessaloniki

(Laboratory of Computing, Medical Informatics and Biomedical - Imaging Technologies) for the past ten years, in a multitude of roles including Requirements Elicitation & Analysis, Software Development, Systems Engineering, and System Security. His main areas of interest are in Health Data Storage and Representation, Semantic Data Representation, and in Clinical Decision Support Systems. He holds a Diploma in Electrical & Computer Engineering (University of Patras), a MSc in Medical Informatics (Aristotle University of Thessaloniki), and a Master of Public Administration (International Hellenic University).

- **Josias Wacker (CSEM)**: Dr. Josias Wacker holds an MSc in biomedical engineering (2007) from the Swiss Institute of Technology, Zurich (ETHZ) and a PhD in microtechnology (2012) from the Swiss Institute of Technology, Lausanne (EPFL). He joined CSEM in 2014 where he develops ergonomic, skin-friendly housings for sensors which measure body signals. He has managed R&D projects on a national and international level.
- **Rita Paradiso (SMARTEX)**: Rita Paradiso graduated in Physics from the University of Genoa and received her Ph.D. in Bioengineering in 1991. Molecular Electronics, Biosensors, Biomaterials for biomedical applications have been her main research topics. In particular she worked on functionalized surfaces and their characterization. She worked in London during the Ph.D. at the Physics Department of Queen Mary College. In 1993 she got a Post Doctor CE fellowship, at the Molecular Chemical Laboratory - CNE Saclay, France. In 1994 she was Post Doctor fellow at the Department of Material Engineering of the University of Trento. During 1998, she worked at the "IRST-Instituto Trentino di Cultura" on bio-activation of MEMS, FIBIA. From 1998-1999 she was Research Manager of Technobiochip s.r.l.- Marciana (LI)-Italy. She has over 60 scientific publications and conference presentation since 1989, H index 27, i10 index 54 (google scholar). She joined Smartex in 2000 as R&D Manager, and from July 2011 is the CEO of the company. From September 2001 was the coordinator of WEALTHY (IST2001- 37778), from January 2004, was working in MYHEART an Integrated Project (IST- 2002-507816) as coordinator of “Functional Bioclothes” consortium and is now working in Psyche (ICT-247777) as technical coordinator. She has a wide experience in national and international research projects, as e-textile expert. She is currently working in WELMO (H2020 825572), TACTILITY (H2020 856718) and SIXTHSENSE (H2020 883315). She won AVANTEX Innovation Prize 2005 Healthcare, she got the Paper Award for IEEE: Transactions on Information Technology in Biomedicine, 2010 EMBS and the Excellent Paper Award in year 2010 for Research Journal of Textile and Apparel.
- **Bruno Rocha (University of Coimbra)**: Bruno Rocha is a PhD student at the Department of Informatics Engineering of the University of Coimbra and member of the Adaptive Computation research group at the Centre for Informatics and Systems of the University of Coimbra (CISUC). His main research interests are in the areas of respiratory sound analysis and music computing. Since completing his master degree in Sound and Music Computing in 2011, Bruno Rocha has participated in several research projects. In 2012 he was a researcher at the University of Amsterdam, where he devised a structural segmentation algorithm and a timbre similarity measure for electronic dance music. In 2013, he moved to the University of Coimbra to study music emotion recognition, focusing on the development of novel features stemming from the analysis of melody and rhythm. From 2015 to 2017, Bruno Rocha was a member of the WELCOME project, developing signal processing algorithms for the detection and classification of cough. That project has been followed by WELMO, where he focuses on the analysis of adventitious respiratory sounds. The common research topic in all those projects has been the combination of audio signal processing and applied machine learning. In 2018, he was attributed a doctoral grant by the Portuguese Foundation for Science and

Technology. Since 2012, Bruno Rocha has published in several conferences and journals of music research and health informatics.

- **Diogo Pessoa (University of Coimbra)**: Diogo Pessoa is a doctoral student in Informatics Engineering at the Centre for Informatics and Systems of the University of Coimbra (CISUC). He is also a member of CISUC's Adaptive Computation research group. His doctoral work concerns the development of automatic algorithms, mostly machine learning-based, to monitor the respiratory function using Respiratory Sound and Electrical Impedance Tomography. In 2019, he concluded his Integrated master's in Biomedical Engineering at the University of Coimbra, with specialization in Bioinformatics and Clinical Informatics. In 2020, he was attributed a doctoral grant by the Portuguese Foundation for Science and Technology. His main research interests include the development of machine learning models applied to medical informatics and signal processing.
- **Sara Casaccia (Università Politecnica delle Marche)**: Sara Casaccia is Assistant Professor of Mechanical and Thermal Measurements at the Department of Industrial Engineering and Mathematical Sciences of Università Politecnica delle Marche. She received her Master degree (cum laude) in Biomedical Engineering in 2011 at Università Politecnica delle Marche (Italy) and her Ph.D in Mechanical Engineering in 2015 in the same institution. She attended the department of Electrical and System Engineering of the Washington University in Saint Louis (Missouri-USA) for a period of 7 months during her Ph.D. Her research focuses on sensors and measurement techniques for supporting people in build and living environments (e.g. comfort, wellbeing), data processing to extract complex information (e.g. using AI), sensors for biomedical applications and non-destructing techniques.
- **Antonio Del Mastro (Mars Planet Italia)**: Antonio Del Mastro is an Electronic/ Telecommunication Engineer with a long experience in the design, risk analysis techniques and certification of devices and systems in the Space and not-Space industry. He is is currently President of Mars Planet (www.marsplanet.org), a private organization member of the International Astronautical Federation focused on the research on human exploration of Space. His main areas of research interest are related to virtual reality, space medicine, robotics, AI. Antonio is the president of the Italian Mars Society which he founded in 2004, as an Italian branch of the International Mars Society and Technical Director of Mars Planet Technologies, a Space company focused on the development of terrestrial applications of Space Research. Currently, he is a member of the working group Science and Technology for Digital Earth of the International Society of Digital Earth (ISDE).
- **Filippo Servalli (Radici InNova)**: Filippo Servalli is Radici Group Corporate Innovation&Research Manager, in the past Marketing Director and Sustainability Manager at Radici Group, one of the most active Italian chemicals companies at an international level. Mr Servalli joined the Radici Group in 1992 as Marketing Manager at Radici Novacips S.P.A., and he previously worked at Acerbis Italia as an R&D specialist. President of the Federchimica "Responsible Care" commission. Member of the UNI and ISO Circular Economy working group.
- **Marta Tessarolo (University of Bologna)**: Marta Tessarolo received the PhD (2016) in Physics at University of Bologna. In her career, she worked in Area Science Park – Trieste developing advanced technologies for cancer diagnostics. Then she moved to the National Research Council (CNR) in Bologna focusing her research on flexible organic solar cells. Recently, she got a post-doc position in University of Bologna, Department of Physics and Astronomy and in the field of wearable textile biosensors based on polymer semiconductors. Nowadays, she wrote more than 40 papers on international scientific journals, attended to many international scientific conferences, she followed the technology transfer on several research projects on textile and flexible biosensors.

- **Inéz Frerichs (Kiel University)**: Dr. Inéz Frerichs is a Professor of Physiology at the Christian Albrechts University in Kiel, Germany. She is the head of the Electrical Impedance Tomography (EIT) research group at the Department of Anaesthesiology and Intensive Care Medicine at the University Medical Centre Schleswig-Holstein, Campus Kiel, Germany. In her scientific career, she has been involved with different aspects of lung-oriented research (e.g. gas transport in the lungs, highfrequency oscillation ventilation, respiratory mechanics, functional lung imaging, wearable lung monitoring). She has published 191 original articles (143 on EIT), 15 reviews and 21 book chapters.
- **Antonis Billis (Mid Sweden University Aristotle University of Thessaloniki)**: Dr. Antonis Billis holds the position of the PostDoc Research Fellow at the Lab of Medical Physics and Digital Innovation. He received his diploma in Electrical and Computer Engineering in 2007 and MSc in Medical Informatics in 2011, both from Aristotle University of Thessaloniki, Greece. Finally, he obtained in 2020 his PhD entitled "Digital biomarkers as ecologically valid measures for the remote and longitudinal assessment of older adults health". His main research interests lie in the areas of sensors, remote health monitoring, medical decision support systems, smart hospital applications, mHealth, AAL technologies and Living Labs. He has authored/co-authored numerous papers in conferences and peer-reviewed journals and has also participated in several European and national research projects related to digital health. He is currently coordinating scientifically the LifeChamps (A Collective Intelligent Platform to Support Cancer Champions) and IntelTriage (Intelligent triage system for hospital emergency departments and clinics) projects. Finally, he has been a member of the technical chamber of Greece since November of 2007.

4.3 School Organization

The organization of the SINTEC Summer School started at the end of 2021 and given the uncertain situation due to the COVID-19 pandemic, it took its final form in the first months of 2022, when Italy and Europe were able to relax the restrictions due to the pandemic. In this way, the SINTEC Summer School was able to benefit from the presence of all the experts directly on site, without having to organize a virtual live broadcast of the event.

4.3.1 Contacts with H2020 Project Coordinator

One of the aims of the SINTEC Summer School was to perform some networking activities with other Horizon 2020 projects to exchange knowledge about the respective project results. All the projects funded in the same topic of SINTEC, ICT-02-2018 - Flexible and Wearable Electronics, were contacted. In particular, the following project coordinators had been asked to participate in the school with some lectures and students coming from the research centers and institutions of their consortia:

- Matthias Fahland: Project Coordinator Smart2Go
- Hossam Haick: Project Coordinator A-Patch
- Gianluca Fiori: Project Coordinator WASP
- Kafil Mahmood: Project Coordinator SmartVista
- Angelika Mader: Project Coordinator WEAFING
- Alexis Melitsiotis: Project Coordinator WELMO
- Deju Chen: Project Coordinator SocketSense
- Luisa Torsi: Project Coordinator SIMBIT

Among them, project WELMO and SOCKET SENSE expressed their availability to participate with some lectures; WELMO organized a short workshop during the event. Another project decided to join the SINTEC

Summer School: the project was called LifeChamps and the Project Coordinator was a contact of the SINTEC partner MySphera.

4.3.2 School Registration procedures

Once arrived at the Summer School venue, participants signed their presence at the registration desk and received the school kit. The kit was composed by (i) a backpack branded with project colour and acronym, a pen gifted by Warrant Hub, a leaflet containing the School Programme, the speaker's bio and some white pages to take notes, and a rain cape with the Project logo.

Figure 16: SINTEC Summer School Kit

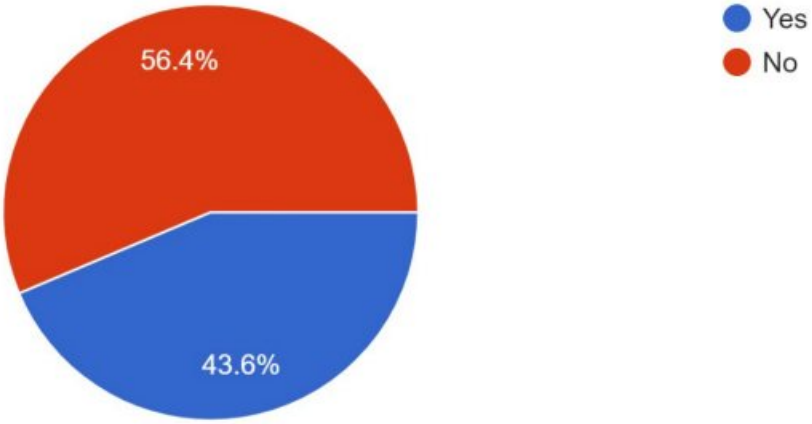
4.3.3 Number of participants

The School saw the participation of 55 people including organizers, researchers, professionals, students and invited external speakers. Participants also signed a permit for the creation of photos and videos containing their image.

Here are some data about the SINTEC Summer School participants:

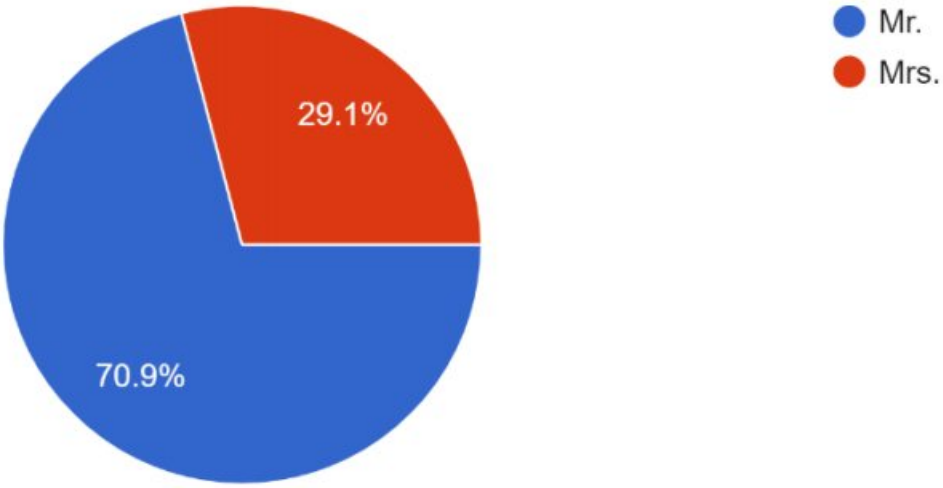
Are you partner of SINTEC project?

55 responses

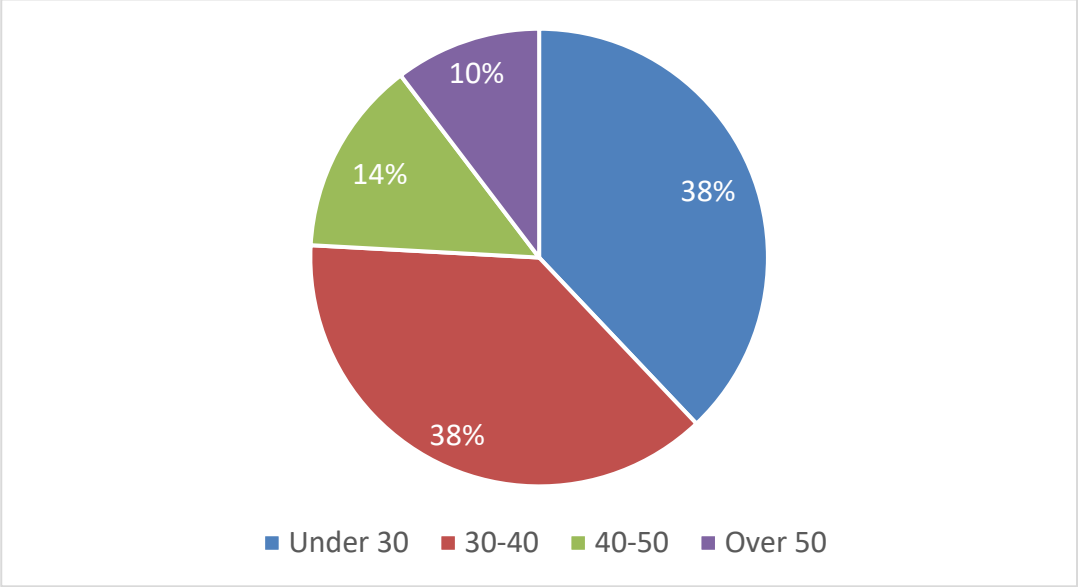


Title

55 responses



AGE



Company/University	n. of people	Country
Uppsala University	7	Sweden
Mycronic	1	Sweden
Luleå University of technology	4	Sweden
KTH Royal Institute of Technology	2	Sweden
University Medical Center SH Campus Kiel	1	Germany
Mid Sweden University and Faculty of Sport	2	Slovenia
Healthcare Innovation Centre/Teesside University	1	UK
MySphera	1	Spain
IMDEA	1	Spain
Evalan	2	The Netherlands

Centre Suisse d'Electronique et de Microtechnique	1	Switzerland
University of Coimbra	2	Portugal
Aristotle University of Thessaloniki	2	Greece
EXODUS	1	Greece
STMicroelectronics	1	Italy
Links Foundation	2	Italy
Warrant Hub	6+2	Italy
Seristampa	1	Italy
Smartex	1	Italy
University of Torino	1	Italy
Politecnico di Torino	5	Italy
University of Ferrara	2	Italy
University of Pisa	2	Italy
University of Palermo	1	Italy
University of Bologna – invited speaker	1	Italy
RADICI Group – invited speaker	2	Italy
Università Politecnica delle Marche – invited speaker	1	Italy

JOB/STUDENTS POSITION

- 6 Professor
- 8 researchers
- 3 Assistant/early stage researchers
- 15 PhD student
- 4 Postdoctoral researchers
- 8 Engineers
- 4 Project Manager
- 3 Dissemination Manager
- 5 Manager

SECTORS

- Materials and mechanical engineering, Computational Engineering, Biomedical Engineering, Electronical Engineering
- Mechatronics and Embedded control systems
- Artificial intelligence
- Pharmaceutical Biotechnology
- Skiing tribology

4.3.4 School budget

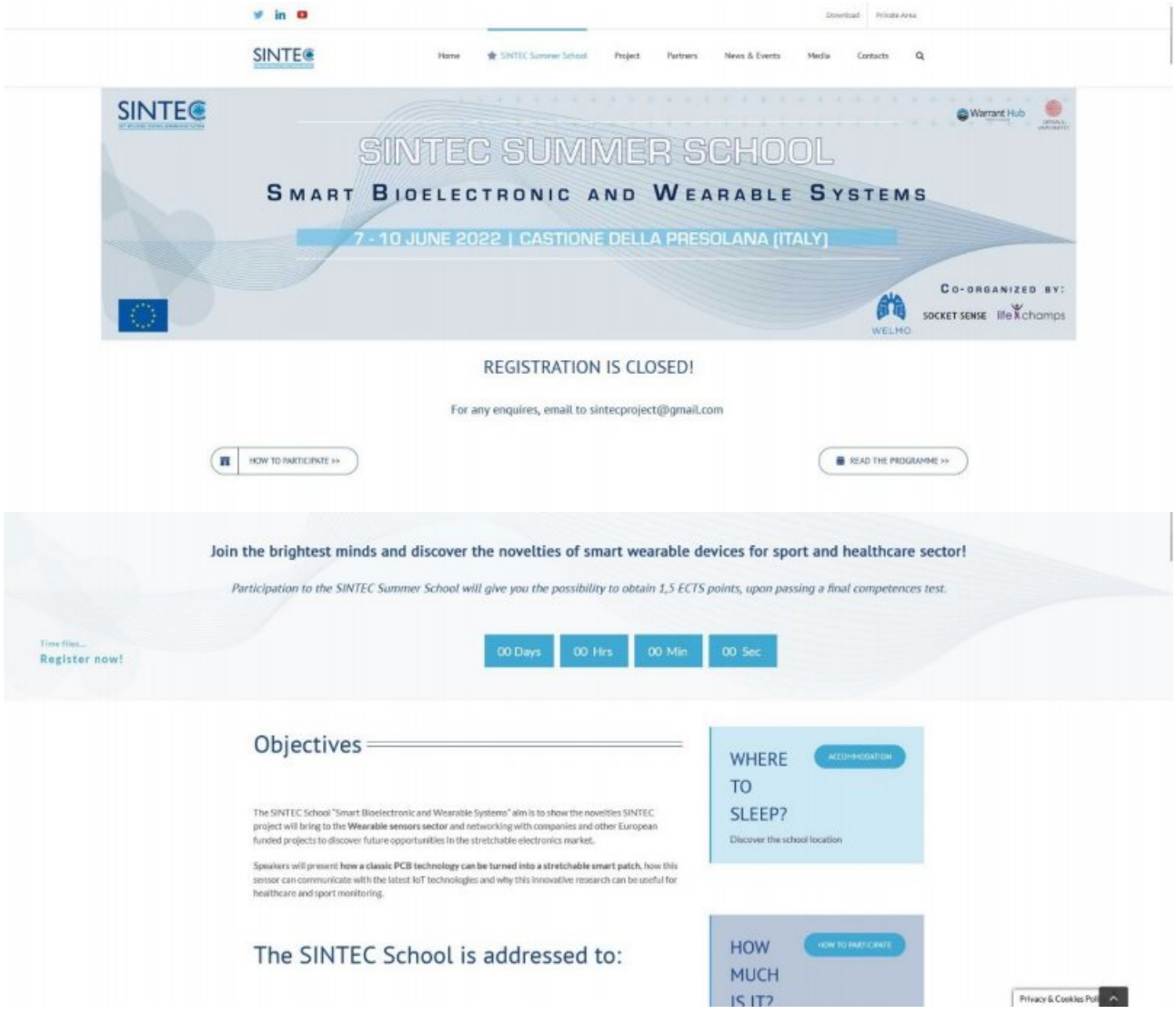
The budget to cover the school was foreseen in the GA. No registration fees were foreseen but participants had to proceed autonomously with accommodation payment and other costs.

4.4 Communication activities

In order to fully and correctly communicate the activities of the SINTEC Summer School, purely online activities based on the project website and on social media have been designed.

4.4.1 SINTEC School Website

The SINTEC Project website was the most important basis of the communication. On it, in fact, a special page has been created for the Summer School with a summary of the event, a specific calendar of each day, a brochure useful for the dissemination of the School and the link useful for registration. After the end of the Summer School a Gallery with all the pictures took during the event was created in order to correctly and fully disseminate di event. On the web page dedicated to the SINTEC Summer School there were also all the information necessary for the stay.



Phd and Postdoc Students

Early Stage Researchers

Industry Practitioners

The event is free, pay only travel and hotel

HAVE A QUESTION?

CONTACT US

We are here to help!

Prepare a poster and present your work or research activity during everyday's poster session!

Participation to the SINTEC Summer School will give you the possibility to obtain 1,5 ECTS points, upon passing a final competences test.

Topics:

- Stretchable Electronics
- Wearables for sport application
- Wearables for healthcare application
- Fat Intra-body communication
- IoT for wearable health and sport monitoring

School Program

School Program

Privacy & Cookies Pol

Prepare a poster and present your work or research activity during everyday's poster session!

Participation to the SINTEC Summer School will give you the possibility to obtain 1,5 ECTS points, upon passing a final competences test.

Day 1 - Tue 7th June 2022 | Day 2 - Wed 8th June 2022 | Day 3 - Thu 9th June 2022 | Day 4 - Fri 10th June 2022

13:00 – 14:00 | WELCOME Light lunch

14:00 – 18:30 | From PCB and Printing Technology to Smart Bioelectronics and Wearables

14.00 – 14.10 **Welcome: school introduction**
Sara Attoui (Warrant Hub)

14.10 – 14.30 **Round table presentation**
All participants

14.30 – 15.00 **SINTEC Project Presentation**
Prof.Klas Hjort (Uppsala University)

15.00 – 15.45 **Printing and PCB technology for flexible and stretchable patches**
Gustaf Mårtenson (Mycronic)

15.45 – 16.15 **Coffee break / Poster Session**

16.15 – 17.00 **IoT solutions and communication between devices**
Hashim Qureshi (Evelan)

Privacy & Cookies Pol

Venue and Accomodation

Sharing of ideas and fostering of interactions will be facilitated by the nice and stimulating location in **Castione della Presolana – BG, Italy.**

Indeed, the location is one of the most beautiful environment in the Northern Italy, offering amazing sights of the mountains and a lot of occasions of relaxing with **excellent food, sport activities and excursions** in the surroundings.

All the participants will be accomodated at **Gran Hotel Presolana.**

How to reach Grand Hotel Presolana

Suggested airport:

- Bergamo Orio al Serio (BGY): 40 km – 1 hour

You can rent a car or informing us about your travel schedule to support you with the hotel transfer.

By car

From the A4 highway, exit Bergamo and follow the signs for Val Seriana until you reach Castione della Presolana.

By train

At Bergamo station take the bus line to Castione della Presolana or inform us about your travel schedule to support you with the hotel transfer.

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4.4.2 Social Media

The SINTEC Summer School was also promoted through the social media of the project with general posts on all aspects concerning it (program, speakers, specific and networking activities), posts regarding the speakers specifically and posts regarding the performance of the activities itself. In particular, all the days of the Summer School saw the publication on the reference social networks of the project of posts and photos regarding what was happening live. The Summer School was then followed step by step by the project media scouts without neglecting any notable event.

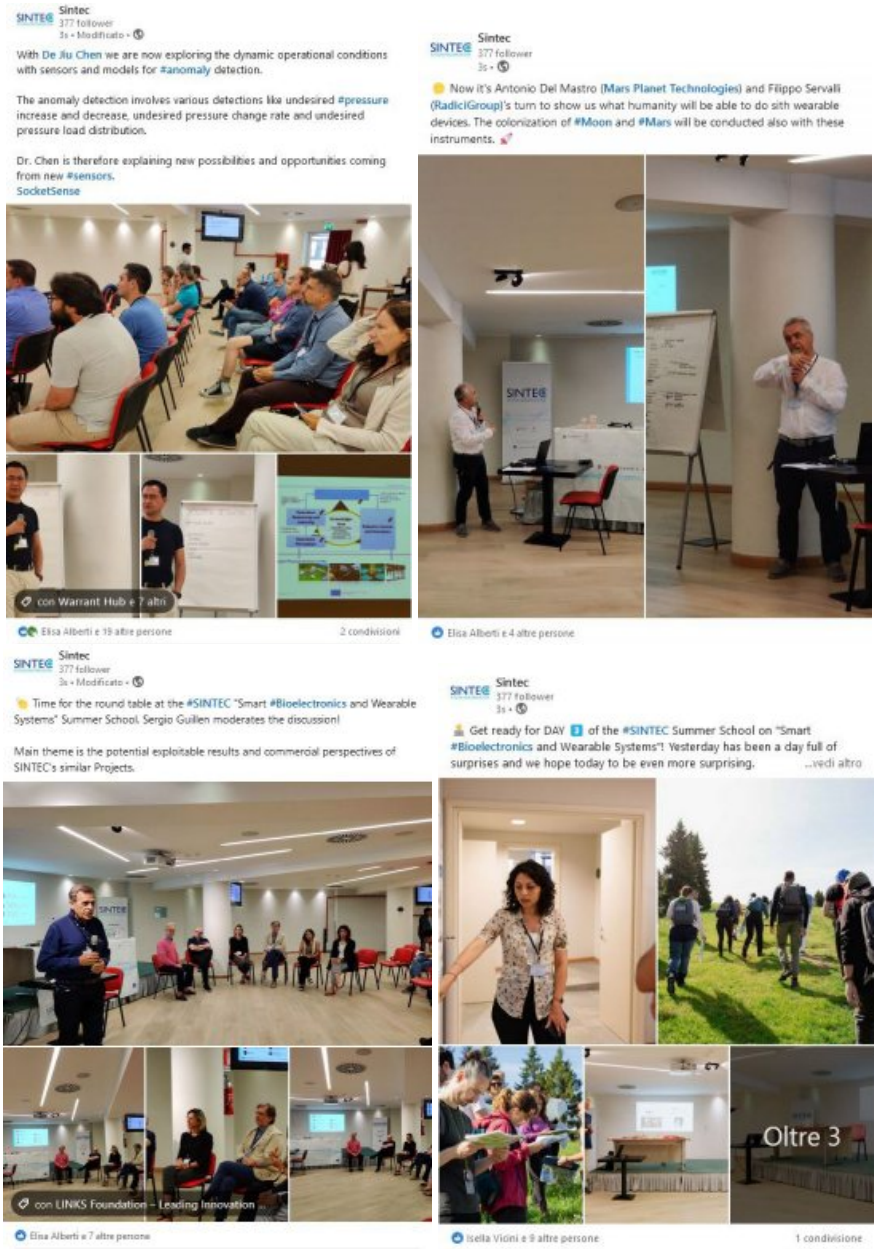
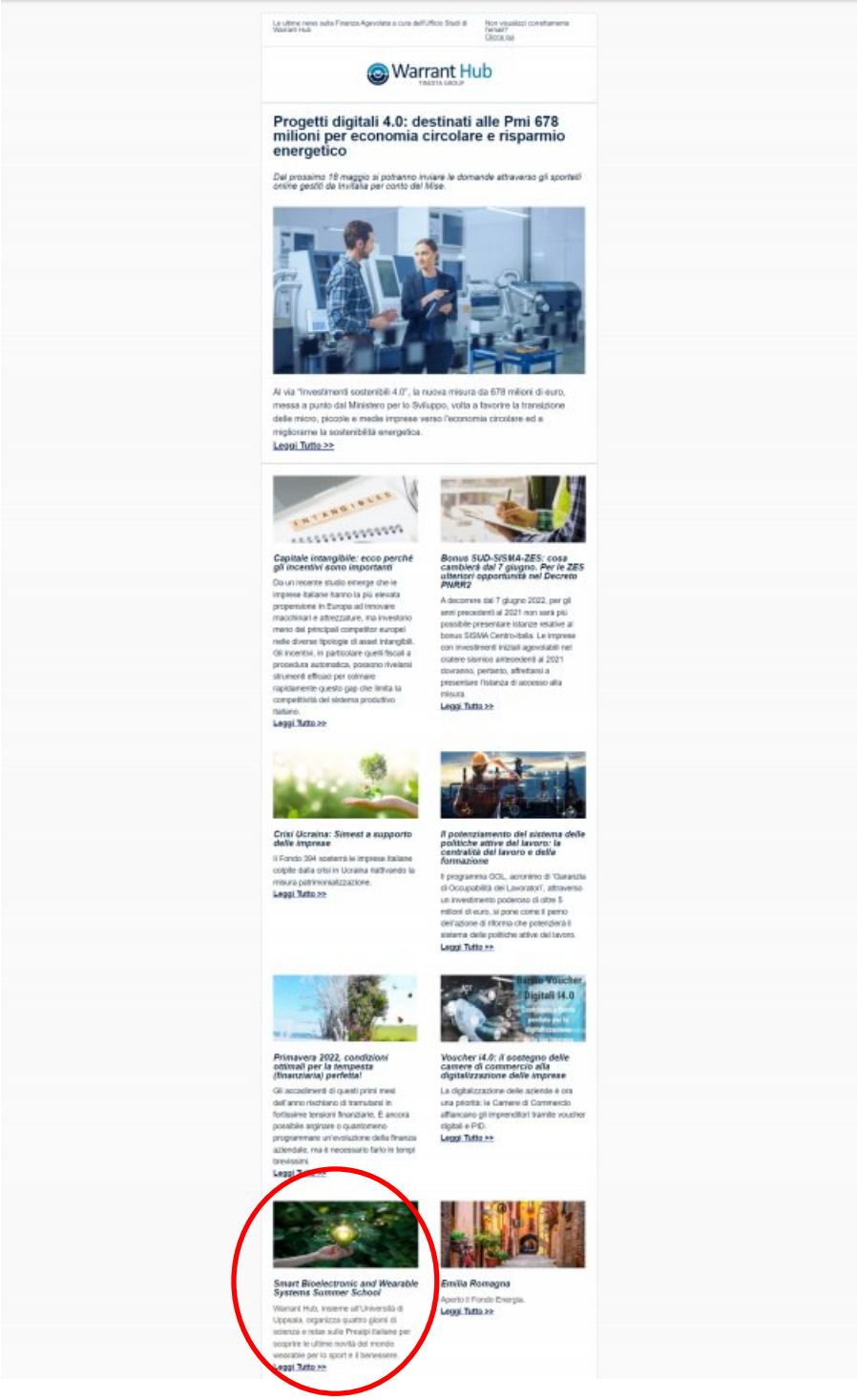


Figure 17: Social Media activity during the event

4.4.3 Newsletters

The school was promoted also by Warrant Hub newsletter (more than 700 contacts) and mailing to direct contacts as well as distribution lists and private contacts.



Warrant Hub

Progetti digitali 4.0: destinati alle Pmi 678 milioni per economia circolare e risparmio energetico

Dal prossimo 18 maggio si potranno inviare le domande attraverso gli sportelli online gestiti da Invitalia per conto del Mise.

Al via "Investimenti sostenibili 4.0", la nuova misura da 678 milioni di euro, messa a punto dal Ministero per lo Sviluppo, volta a favorire la transizione delle micro, piccole e medie imprese verso l'economia circolare ed a migliorarne la sostenibilità energetica.

Leggi Tutto >>

Capitale intangibile: ecco perché gli incentivi sono importanti

Da un recente studio emerge che le imprese italiane hanno la più elevata propensione in Europa ad innovare macchinari e attrezzature, ma investono meno dei principali competitor europei nelle diverse tipologie di asset intangibili. Gli incentivi, in particolare quelli fiscali a procedura automatica, possono rivelarsi strumenti efficaci per colmare rapidamente questo gap che limita la competitività del sistema produttivo italiano.

Leggi Tutto >>

Bonus SUD-SISMA-ZES: cosa cambierà dal 7 giugno. Per le ZES ulteriori opportunità nel Decreto PNRR2

A decorrere dal 7 giugno 2022, per gli anni precedenti al 2021 non sarà più possibile presentare istanze relative al bonus SISMA Centro-Italia. Le imprese con investimenti iniziali agevolabili nel cratere sismico antecedenti al 2021 dovranno, pertanto, attivarsi a presentare l'istanza di accesso alla misura.

Leggi Tutto >>

Crisi Ucraina: Simest a supporto delle imprese

Il Fondo 394 sosterrà le imprese italiane colpite dalla crisi in Ucraina riattivando la misura patrimonializzazione.

Leggi Tutto >>

Il potenziamento del sistema delle politiche attive del lavoro: la centralità del lavoro e della formazione

Il programma GOL, acronimo di "Garanzia di Occupabilità dei Lavoratori", attraverso un investimento pubblico di oltre 5 milioni di euro, si pone come il perno dell'azione di riforma che potenzierà il sistema delle politiche attive del lavoro.

Leggi Tutto >>

Primavera 2022, condizioni ottimali per la tempesta (finanziaria) perfetta!

Gli accadimenti di questi primi mesi dell'anno rischiano di tramutarsi in forbiciate tensioni finanziarie. È ancora possibile arginare o quantomeno programmare un'evoluzione della finanza aziendale, ma è necessario farlo in tempi brevissimi.

Leggi Tutto >>

Voucher i4.0: il sostegno delle camere di commercio alla digitalizzazione delle imprese

La digitalizzazione delle aziende è ora una priorità: le Camere di Commercio affiancano gli imprenditori tramite voucher digitali e PID.

Leggi Tutto >>

Smart Bioelectronic and Wearable Systems Summer School

Warrant Hub, insieme all'Università di Uppsala, organizza quattro giorni di scienza e relax sulle Prealpi italiane per scoprire le ultime novità del mondo wearable per lo sport e il benessere.

Leggi Tutto >>

Emilia Romagna

Aperto il Fondo Energia.

Leggi Tutto >>

4.4.4 Mailing Lists

An invitation email template was developed and shared among the project partners and the co-organizing projects with the aim of inviting personal contacts. The email described the main event objectives, a general description of the event and the links to the registration form. A banner at the end of the email was enclosed.

This was the text of the email template:

Dear Mr/Mrs. xxx,

My name is xxx and I'm contacting you because I'm the Dissemination Manger of an EU funded project that is developing an intelligent smart patch for sport and health monitoring. The project is called SINTEC and it is coordinated by the Prof. Klas Hjort, Head of the Microsystem Technology programme at the Dept. Engineering Sciences of Uppsala University (Sweden).

On behalf of the Project Coordinator, I would like to suggest you a Summer School we are organizing entitled ***"Smart Bioelectronic and Wearable Systems Summer School"****. The school will be held on* ***June 7th – 10th , 2022, in-person at Castione della Presolana (Bergamo – Italy)****: the event is free, participants will take care only of travel and accommodation costs. You can find more details at: https://www.sintec-project.eu/smart-bioelectronic-and-wearable-systems-summer-school/*

The aim of the school is to show the novelties SINTEC project will bring to the ***Wearable sensors sector*** *and networking with companies and other European funded projects to discover future opportunities for the stretchable electronics market. Speakers will present how a classic PCB technology can be turned into a stretchable smart patch, how this sensor can communicate with the latest IoT technologies and why this innovative research can be useful for healthcare and sport monitoring.*

Daily tours at open air and relaxing moments will be offered to test the SINTEC stretchable smart patch, enjoy participants' stay and to forge new relationships.

The school is addressed to young scientists and professionals, PhD and master thesis students and young researchers: maybe, someone of your lab could be interested to participate. Participants will have the opportunity to present their research activity to the audience during the ***poster sessions*** *we will organize every day and to obtain* ***1.5 ECTS points****, upon passing a final competences test.*

I hope the event can be of your interest: please, feel free to contact me in case of any further information.

Kind regards,

xxx

4.4.5 Other Websites

A press release (see Figure 19) was sent to different websites and Press offices. The news about the SINTEC School was published on the European Commission website, Summer School in Europe website, the European College of Sport Science website and social media, Smartees project website, Warrant Hub's website, Socket Sense's website, Dailyideashelp website, SMARTEX website, Uppsala University website, University of Ljubljana website.

4.4.6 School Flyer

An advertising flyer was sent to the partners and to the other projects participating to the school to share it digitally among their contacts to spread the news about the Summer School.

Figure 18: SINTEC Summer School flyer

4.4.7 Press release

A press release was developed and share among the SINTEC project partners and co-organizing project to properly disseminating the event.

Smart Bioelectronic and Wearable Systems Summer School

Four days of science and relax on the Italian pre-alps to discover the latest updates about stretchable electronics devices for sport and healthcare.

Castione della Presolana (BG) – Italy, 7-10 June 2022 | SINTEC project, started in January 2019 and funded by the European Commission under the Horizon 2020 programme with almost 4 million euros, is organizing a Summer School with the aim of sharing the SINTEC project latest achievements, presenting and testing the first stretchable smart patch prototype and exchanging knowledge with students, researchers, and professionals of the wearable electronics sector. The school will be held in-person at Castione della Presolana (Italy) from the 7th of June 2022 until the 10th of June 2022. The event is free upon registration on SINTEC project website: https://www.sintec-project.eu/smart-bioelectronic-and-wearable-systems-summer-school/

The aim of the school is to show the novelties SINTEC project will bring to the Wearable sensors sector and networking with companies and other European funded projects to discover future opportunities for the stretchable electronics market. Speakers will present how a classic PCB technology can be turned into a stretchable smart patch, how this sensor can communicate with the latest IoT technologies and why this innovative research can be useful for healthcare and sport monitoring.

The lectures will be organized in two sessions during the day: first, general overviews will be presented by key-note scientists and European industry leaders; then, case studies from EU funded projects WELMO, SocketSense and LifeChamps that supports the event for the scientific program and more applicative issues will be showcased. The event, co-organized by Warrant Hub and Uppsala University, will be participated by high level professionals and researchers. Daily tours at open air and relaxing moments will be offered to test the SINTEC stretchable smart patch, to enjoy participants' stay and to forge new relationships among participants. Participants will have the opportunity to present their research activity to the audience during the poster sessions we will organize every day; moreover, they will have the possibility to obtain 1,5 ECTS points, upon passing a final competences test

"We have chosen the pre-alps, in particular Castione della Presolana, because it is the perfect place to study but also because it is a great opportunity to visit a gorgeous place and to create new interactions among professionals" – says Isella Vicini, Director of the European Funding Development of Warrant Hub S.p.A. organizer of the Summer School – "for these reasons, the program includes also guided tours to discover this beautiful land.

The school accepts a maximum of 50 participants. More info about registration procedures and school agenda are available at: https://www.sintec-project.eu/smart-bioelectronic-and-wearable-systems-summer-school/

SINTEC PROJECT:

The aim of SINTEC is to advance a rigid-stretch PCB technology with stretchable substrate and liquid alloy, and to demonstrate its usability in complex applications, involving wearable sensing, embedded processing, and Fat-IBC. This will substantiate the advantages with this rigid-stretch technology and its improvement area. Industrial manufacturability and cost/scaling issues will be investigated. Its unique features will enable a ground-breaking intra body communication technique that provides secure communication at large bandwidth and low power, allowing for multiplex sensorics inputs from many sensor nodes on the body.

MORE INFO: https://www.sintec-project.eu

CONTACTS: **Project Coordinator:** *Klas Hjort* (Uppsala University) | klas.hjort@angstrom.uu.se

School Secretariat: *Sara Attanà* (Warrant Hub S.p.A.) | sintecproject@gmail.com

"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824984".

SINTEC

Figure 19: SINTEC Summer School Press Release

4.4.8 Promotion at conferences/event

On March 23rd and 24th, 2022, SINTEC project participated at LOPEC 2022, the world's leading communication platform for technology, solutions, knowledge, and research in the printed electronics industry. More than 200 presentations, 156 exhibitors and around 2,000 visitors from more than 35 countries visited Munich for this international exhibition and conference for flexible, organic, and printed electronics.

SINTEC project participated to the event inside Warrant Hub booth: Sara Attanà, Communication Manager of SINTEC project presented the Summer School to the people present at the fair.

The result of this dissemination activity was the registration to the school of two students coming from the University of Pisa and the networking with other H2020 projects, among them Smartees project that decided to publish a news related to the event on their platform.

Figure 20: Dissemination activity at LOPEC 2022

4.4.9 After School Communication activities

During the SINTEC Summer School, some pictures, video interviews and shootings were performed. The pictures have been used to create a gallery on the project website with the aim of disseminating, in a visual way, all the activities performed at the event. Every important moment of the school was registered, and a conclusive video will be produced and shared on the project website and on the project social media channels. Moreover, some of the partners were interviewed with the aim of creating some video material to disseminate project preliminary results. Specifically, the interviewed partners and the topic discussed were:

- **The power of IoT for the SINTEC prototype**
  Interview with Hashim Quraishi | Evalan
- **One smart patch to rule them all!**
  Interview with Alessandro Gumiero | STMicroelectronics
- **A revolution for sports people**
  Interview with Nina Verdel | Mid Sweden University and University of Ljubljana
- **Market opportunities for the SINTEC final smart patch**
  Interview with Gustaf Mårtensson | Mycronic

Figure 21: Interviews to the partners

5 CONCLUSIONS

In conclusion, it can certainly be said that the SINTEC Summer School was a success.

- 55 participations
- 4 networking opportunities
- 27 students
- 14 posters presented
- 2 practical activities and testing of the prototype developed by SINTEC
- 10 countries represented
- 4 days of school

All participants demonstrated a high level of interest, and all the sessions were highly participated: networking was really improved thanks to the social activities organized during the four days, speakers gave lots of practical inputs related to their presentation and students were very active during each session, asking questions and giving interesting feedbacks. At the end of the event, participants were asked to express their opinion on the SINTEC Summer School through an online questionnaire. Questions and answers are available at **Annex V**.

Inside the questionnaire, people were asked also to give their opinion about strength, weaknesses, opportunities, and threats of the SINTEC Smart patch: the aim was to collect external feedbacks to develop a SWOT analysis about the sensor.

Here are the feedbacks collected:

1. In your opinion, what are the strengths of the SINTEC smart patch?
From my perspective the most significant key-point is application in telemedicine by exploiting telemonitoring approaches and implementing AI algorithms embedded for 2nd opinion clinical theranostic aims.
It is flexible and water repellent.
Easy to use
Comfort
Comfortable
The possibility to share ideas and create a network.
Measuring without interfering natural body movements. Reusable parts. Easy use.
The possibility to monitor health parameters in various settings and environments
Flexible and durable for demanding activities and movements. Comfortable to wear
Lightweight, unnoticable

Connections between textiles and rigid electronics
stretchability, comfortability.
conformal, comfortable, low height, accurate placement also on places where straps are less suitable, disposable low-cost patch and reusable high-cost module
flexibility and stretchability
Design, features, battery
comfort
comfortable, does not move relative to skin

2. In your opinion, what are the weaknesses of the SINTEC smart patch?
I think sweat and battery supply.
The flexibility of patch may affect the performance of circuit. For example, the PCB antenna's RF parameter will change when patch is stretched.
Disposable
Bluetooth connection, sensors recycling?
Patch reusability and lifetime
The smart patches are too far from the market.
The possibility to combine sensors and transmit data with Bluetooth. Battery time. Non reusable parts. Missing functionalities in monitoring software or app. Capturing different data from same sensor. IMU + Pressure for example.
The users may experience some trouble with the BLE connectivity
The application with adhesive tape could be a barrier to use spontaneously.
Short battery life
not fully textile sensors
permeability
disposable patch, need cumbersome work to place it and often help from another person

sticky contact
Connection issues with the app
instability
sweat buildup under patch

In your opinion, what are the opportunities for the SINTEC smart patch?
Research, sport applications, health applications, telemonitoring long-term application.
If it goes battery-free by harvesting energy from the environment, it would be a great improvement.
Smart home
more accurate tracking in the wild
Under water measurement of athletes? Cross-country skiing without disturbance of clunky sensors. Place stretchable sensor on athletes' cloths like gloves, hat and so on.
To have an idea of the new technologies.
If sync and combinations get to work it is possible to monitor many parameters and combine results, both for medical and sports purpose.
Integration in smart systems and IoT Hubs both in the domestic environment and health-related monitoring scenario (hospital & sports)
The good fit ensures better quality data compared to a sensor that is not flexible and can loose contact during demanding situations. For ex I have problems with my smartwatch pulse sensor not being in contact with my wrist when skiing.
Limitless
integration in smart clothes
healthcare applications
precise measurements on several places less suitable for straps where the higher costs and cumbersome dressing is accepted, e.g., sports performance and clinical
patient monitoring
Multi-disciplinary capabilities
ease of use, out-of-the-box solution, low technical user knowledge required

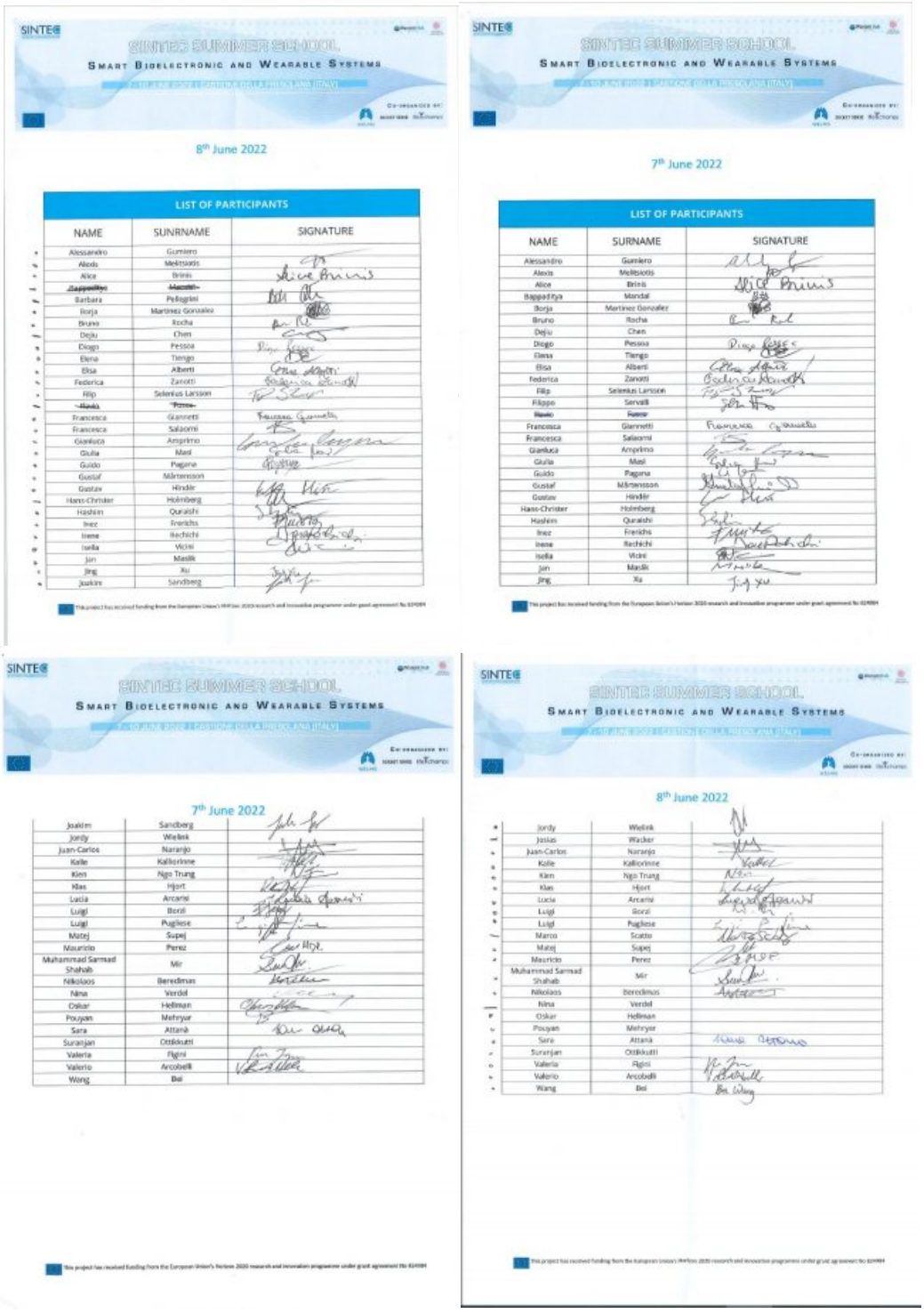
In your opinion, what are the threats of the SINTEC smart patch?
I think again sweat
I am not sure about this question.
watch
make the whole production and disposal sustainable
Other similar products could be: bio implant, wearable sensor expanding into more than just watches.
I don't see threats.
That transmitting with fat-IBC does not work. Other similar sensor with different technology that works better
Data protection
Cost?
Fitness smart watches
competitors in wearable devices, where sensors are directly realized on textiles
data security
too costly and cumbersome or that e-textile provides high enough quality and precision
none known
Availability, price
limited battery life, low data sampling rates

A total number of 14 students completed the evaluation test to get the University credits; among them, 13 passed the test and a certificate was given to ask for 1,5 ECTS credits. It is possible to see evaluation test's questions and answers in **Annex IV**.

Most of the Summer School participants expressed their consent to receive information about next SINTEC project workshops and events; the 83.3% of them are now interested to know more about European funded projects and to participate in the next call of Horizon Europe.

6 ANNEXES

6.1 ANNEX I – SINTEC summer school participants



SINTEC SUMMER SCHOOL
SMART BIOELECTRONIC AND WEARABLE SYSTEMS

8th June 2022

LIST OF PARTICIPANTS

NAME	SURNAME	SIGNATURE
Alessandro	Gumiero	
Alexis	Melitsiotis	
Alice	Brinis	
~~Bappaditya~~	~~Mandal~~	
Barbara	Pellegrini	
Borja	Martinez Gonzalez	
Bruno	Rocha	
Deju	Chen	
Diogo	Pessoa	
Elena	Tiengo	
Elisa	Alberti	
Federica	Zanotti	
Filip	Selenius Larsson	
~~Filippo~~	~~Ferro~~	
Francesca	Giannetti	
Francesca	Salaorni	
Gianluca	Amprimo	
Giulia	Masi	
Guido	Pagone	
Gustaf	Mårtensson	
Gustav	Hindér	
Hans-Christer	Holmberg	
Hashim	Quraishi	
Inez	Frerichs	
Irene	Rechichi	
Isella	Vicini	
Jan	Maslik	
Jing	Xu	
Joakim	Sandberg	

7th June 2022

NAME	SURNAME	SIGNATURE
Alessandro	Gumiero	
Alexis	Melitsiotis	
Alice	Brinis	
Bappaditya	Mandal	
Borja	Martinez Gonzalez	
Bruno	Rocha	
Deju	Chen	
Diogo	Pessoa	
Elena	Tiengo	
Elisa	Alberti	
Federica	Zanotti	
Filip	Selenius Larsson	
Filippo	Servalli	
~~Ilaria~~	~~Ferro~~	
Francesca	Giannetti	
Francesca	Salaorni	
Gianluca	Amprimo	
Giulia	Masi	
Guido	Pagone	
Gustaf	Mårtensson	
Gustav	Hindér	
Hans-Christer	Holmberg	
Hashim	Quraishi	
Inez	Frerichs	
Irene	Rechichi	
Isella	Vicini	
Jan	Maslik	
Jing	Xu	

SINTEC SUMMER SCHOOL
SMART BIOELECTRONIC AND WEARABLE SYSTEMS

7th June 2022

Joakim	Sandberg
Jordy	Wielink
Juan-Carlos	Naranjo
Kalle	Kallioniemi
Kien	Ngo Trung
Klas	Hjort
Lucia	Arcarisi
Luigi	Borzì
Luigi	Pugliese
Matej	Supej
Mauricio	Perez
Muhammad Sarmad Shahab	Mir
Nikolaos	Bereolmas
Nina	Verdel
Oskar	Hellman
Pouyan	Mehryar
Sara	Attaria
Suranjan	Ottilkutti
Valeria	Pigini
Valerio	Arcobelli
Wang	Bei

SINTEC SUMMER SCHOOL
SMART BIOELECTRONIC AND WEARABLE SYSTEMS

8th June 2022

Jordy	Wielink
Josias	Wacker
Juan-Carlos	Naranjo
Kalle	Kallioniemi
Kien	Ngo Trung
Klas	Hjort
Lucia	Arcarisi
Luigi	Borzì
Luigi	Pugliese
Marco	Scatto
Matej	Supej
Mauricio	Perez
Muhammad Sarmad Shahab	Mir
Nikolaos	Bereolmas
Nina	Verdel
Oskar	Hellman
Pouyan	Mehryar
Sara	Attaria
Suranjan	Ottilkutti
Valeria	Pigini
Valerio	Arcobelli
Wang	Bei

SINTEC SUMMER SCHOOL
SMART BIOELECTRONIC AND WEARABLE SYSTEMS

9th June 2022

LIST OF PARTICIPANTS

NAME	SURNAME	SIGNATURE
Alessandro	Gumiero	
Alexis	Meitsiotis	
Alice	Brinis	
Antonis	Billis	
[redacted]	[redacted]	
Barbara	Pellegrini	
Borja	Martinez Gonzalez	
Bruno	Rocha	
Danilo	Demarchi	
Deju	Chen	
Diogo	Pessoa	
Elena	Tiengo	
Elisa	Alberti	
Emilio	Vanoli	
Federica	Zanetti	
Filip	Selenius Larsson	
Filippo	Servalli	
[redacted]	[redacted]	
Francesca	Giannetti	
Francesca	Salaorni	
Gianluca	Amprimo	
Giulio	Masi	
Guido	Pagana	
Gustaf	Mårtensson	
Gustav	Hindér	
Hans-Christer	Holmberg	
Hashim	Quraishi	
Inez	Frerichs	
Irene	Rechichi	
Isella	Vicini	

SINTEC SUMMER SCHOOL
SMART BIOELECTRONIC AND WEARABLE SYSTEMS

9th June 2022

Jan	Madlik	
Jing	Xu	
Joakim	Sandberg	
Jordy	Wielink	
Josias	Wacker	
Juan-Carlos	Naranjo	
Kalle	Kallorinne	
Kien	Ngo Trung	
Klas	Hjort	
Laura	Ferlauto	
Lucia	Arcarisi	
Luigi	Borzi	
Luigi	Pugliese	
Marco	Scatto	
Marta	Tessarolo	
Matej	Supej	
Mauricio	Perez	
Muhammad Sarmad Shahab	Mir	
Nikolaos	Bereolmus	
Nina	Verdel	
Oskar	Hellman	
Ottikkutti	Suranjan	
Pouyan	Mehryar	
Rita	Paradiso	
Sara	Attanà	
Sara	Casaccia	
Sergio	Guillen	
Valeria	Figini	
Valerio	Arcobelli	
Wang	Bei	

SINTEC SUMMER SCHOOL
SMART BIOELECTRONIC AND WEARABLE SYSTEMS

10th June 2022

LIST OF PARTICIPANTS

NAME	SURNAME	SIGNATURE
Alessandro	Gumiero	
Alexis	Meitsiotis	
Alice	Brinis	
Antonio	Del Mastro	
Antonis	Billis	
[redacted]	[redacted]	
Borja	Martinez Gonzalez	
Bruno	Rocha	
Danilo	Demarchi	
Deju	Chen	
Diogo	Pessoa	
Elena	Tiengo	
Elisa	Alberti	
Emilio	Vanoli	
Federica	Zanetti	
Filip	Selenius Larsson	
Filippo	Servalli	
[redacted]	[redacted]	
Francesca	Giannetti	
Francesca	Salaorni	
Gianluca	Amprimo	
Giulia	Masi	
Guido	Pagana	
Gustaf	Mårtensson	
Gustav	Hindér	
Hashim	Quraishi	
Inez	Frerichs	
[redacted]	[redacted]	
Irene	Rechichi	
Isella	Vicini	

SINTEC SUMMER SCHOOL
SMART BIOELECTRONIC AND WEARABLE SYSTEMS

10th June 2022

Jan	Madlik	
Jing	Xu	
Joakim	Sandberg	
Jordy	Wielink	
Josias	Wacker	
Juan-Carlos	Naranjo	
Kalle	Kallorinne	
Kien	Ngo Trung	
Klas	Hjort	
Laura	Ferlauto	
Lucia	Arcarisi	
Luigi	Borzi	
Luigi	Pugliese	
Marco	Scatto	
Marta	Tessarolo	
Matej	Supej	
Mauricio	Perez	
Muhammad Sarmad Shahab	Mir	
Nikolaos	Bereolmus	
Nina	Verdel	
Oskar	Hellman	
Ottikkutti	Suranjan	
Pouyan	Mehryar	
Rita	Paradiso	
Sara	Attanà	
Sara	Casaccia	
Sergio	Guillen	
Valeria	Figini	
Valerio	Arcobelli	
Wang	Bei	

6.2 ANNEX II – School Program

SINTEC

DAY 1

From PCB and Printing Technology to Smart Bioelectronics and Wearables

Tuesday, 7th June 2022

13:00 - 14:00 Registration & Welcome

14:00 - 18:30

TIME	TITLE OF THE SPEECH	SPEAKER
14.00 - 14.10	Welcome: school introduction	**Sara Attanà** (Warrant Hub)
14.10 - 14.30	Round table presentation	All participants
14.30 - 15.00	SINTEC Project presentation	**Prof. Klas Hjort** (Uppsala University)
15.00 - 15.45	Printing and PCB technology for flexible and stretchable patches	**Gustaf Mårtensson** (Mycronic)
15.45 - 16.15	Coffee break / Poster Session	
16.15 - 17.00	IoT solutions and communication between devices	**Hashim Quraishi** (Evalan)
17.00 - 17.45	Sensor Technology for Health and Wellbeing	**Alessandro Gumiero** (STMicroelectronics)
17.45 - 18.30	Open discussion	**Prof. Klas Hjort** (Uppsala University)
18:30	Closing of the first day school	

20:00 - 22:00 Dinner at the Hotel

"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824984".

SINTEC

DAY 2

Smart Bioelectronics and Wearables for Sport Monitoring

Wednesday, 8th June 2022

8:00 - 14:00 TREKKING TO MONTE PORA & MONTE ALTO – 1,723 m
(Lunch included @Rifugio Magnolini)

Let's apply some smart patch prototypes to see how they work and discuss about the results during the afternoon!

15:00 - 18:30

TIME	TITLE OF THE SPEECH	SPEAKER
15.00 - 15.15	Welcome	**Sara Attanà** (Warrant Hub) **Prof. Klas Hjort** (Uppsala University)
15.15 - 16.00	Wearable technologies in winter sports: Physiology and Biomechanics	**Matej Supej** (University of Ljubljana) **Hans-Christer Holmberg** (Luleå University of Technology)
16.00 - 16.30	Wearable technology in summer sports	**Nina Verdel** (Mid Sweden University)
16.30 - 17.00	Coffee break / Poster Session	
17.00 - 17.30	Challenges to perform measurements in the laboratory vs. the field: state of the art and perspectives	**Barbara Pellegrini** (University of Verona)
17.30 - 18.00	Fat-IBC: A new paradigm in Body-Area Communication	**Mauricio Perez** (Uppsala University)
18:00 - 18:30	Open Discussion	**Prof. Klas Hjort** (Uppsala University)
18.30	Closing of the second day school	

20:00 - 23:00 Dinner at the hotel

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DAY 3

Smart Bioelectronics and Wearables for Monitoring Health Parameters

Thursday, 9th June 2022

8:30 - 13:00 TREKKING ON PREDUSOLO NATURAL PARK
13:00 - 14:00 Light Lunch
14:00 - 18:30

TIME	TITLE OF THE SPEECH	SPEAKER
14.00 – 14.15	Welcome	**Sara Attanà** (Warrant Hub) **Prof. Klas Hjort** (Uppsala University)
14.15 – 15.00	LifeChamps sensing platform and digital biomarkers for monitoring QoL of older cancer survivors	**Antonis Billis** (Aristotle University of Thessaloniki)
15.00 – 15.30	Smart patches and Wearables for clinical applications	**Guido Pagana** (LINKS Foundation)
15.30 – 16.00	Coffee break / Poster Session	
16.00 – 16.30	Clinical trials for socket comfort analysis and constructing biomechanical models for sensor deployment	**Pouyan Mehryar** (Teesside University)
16.30 – 17.00	Analyzing dynamic operational conditions with sensors and models for anomaly detection	**Dejiu Chen** (KTH)
17.00 – 17.45	Effective monitoring of lung activity in lung related chronic diseases patients utilizing sound and visual signals in a comfortable wearable setting	**Alexis Melitsiotis** (EXODUS) **Nikolaos Beredimas** (Aristotle University of Thessaloniki)
17.45 – 18.15	Open Discussion	**Prof. Klas Hjort** (Uppsala University)
18.15	Closing of the third day school	

20:00 - 23:00 Gala dinner

"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824984".

SINTEC

DAY 4

General Applications and Perspectives in Smart Bioelectronics and Wearables

Friday, 10th June 2022

TIME	TITLE OF THE SPEECH	SPEAKER
09:00 - 09:15	Welcome	**Sara Attanà** (Warrant Hub) **Prof. Klas Hjort** (Uppsala University)
09:15 - 10:00	Non-invasive chest imaging and sound analysis of lung activity validated in 2 clinical studies A). Electronics and Textiles development B). Algorithmic development and Visualisation C). Sound, EIT analysis and validation	**Josias Wacker** (CSEM) **Rita Paradiso** (SMARTEX) **Nikolaos Beredimas** (Aristotle University of Thessaloniki) **Bruno Rocha, Diogo Pessoa** (University of Coimbra) **Inez Frerichs** (Kiel University)
10:00 - 10:45	Round-table – potential exploitable results and commercial perspectives	**Sergio Guillen** (MySphera)
10:45 - 11:15	Coffee break / Poster Session	
11:15 - 11:45	Using wearables and Artificial Intelligence to measure personal comfort in living environments	**Sara Casaccia** (Università Politecnica delle Marche)
11:45 - 12:15	Wearable prototype for space and industrial applications	**Antonio Del Mastro** (Mars Planet Italia) **Filippo Servalli** (Radici InNova)
12:15 - 12:45	Smart Bandage with textile organic biosensors for wearable healthcare	**Marta Tessarolo** (University of Bologna)
12:45 - 13:30	Open discussion - Closing of the school and graduation	**Isella Vicini, Sara Attanà** (Warrant Hub) **Prof. Klas Hjort** (Uppsala University)

13:30 - 14:30 Light lunch & Farewell

6.3 ANNEX III – Photograph & Video Release Form

Photograph & Video Release Form

I hereby grant permission to the rights of my image, likeness and sound of my voice as recorded on audio or video tape without payment or any other consideration. I understand that my image may be edited, copied, exhibited, published or distributed and waive the right to inspect or approve the finished product wherein my likeness appears. Additionally, I waive any right to royalties or other compensation arising or related to the use of my image or recording. I also understand that this material may be used in diverse educational settings within an unrestricted geographic area.

Photographic, audio or video recordings may be used for the following purposes:

- Internal use
- Educational presentations
- Informational presentations
- On-line educational courses
- Educational videos
- Social Media Communications

By signing this release, I understand this permission signifies that photographic or video recordings of me may be electronically displayed via the Internet or in the public educational setting.

I will be consulted about the use of the photographs or video recording for any purpose other than those listed above.

There is no time limit on the validity of this release nor is there any geographic limitation on where these materials may be distributed.

This release applies to photographic, audio or video recordings collected as part of the sessions listed on this document only.

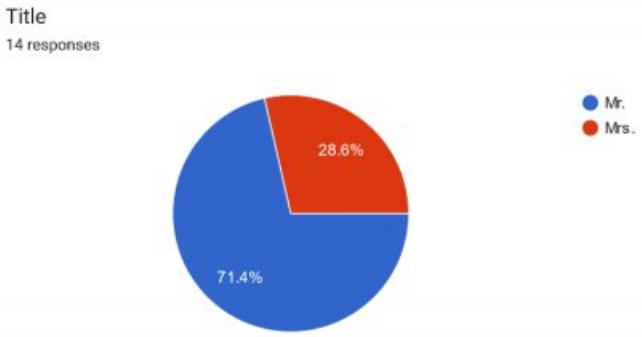
By signing this form I acknowledge that I have completely read and fully understand the above release and agree to be bound thereby. I hereby release any and all claims against any person or organization utilizing this material for educational purposes.

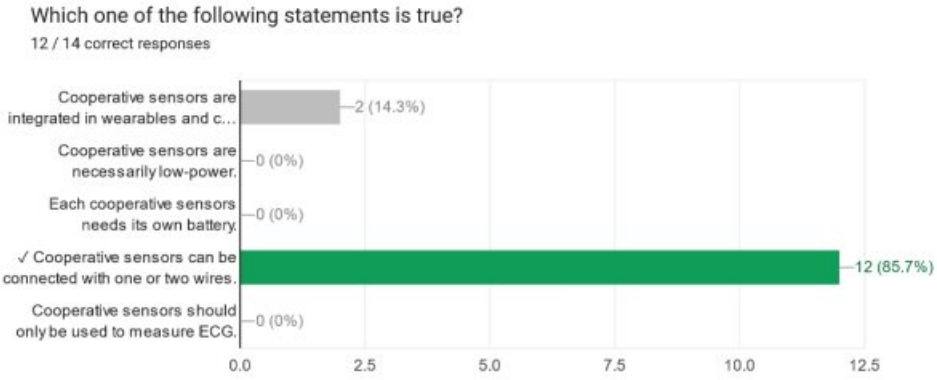
Full Name_____

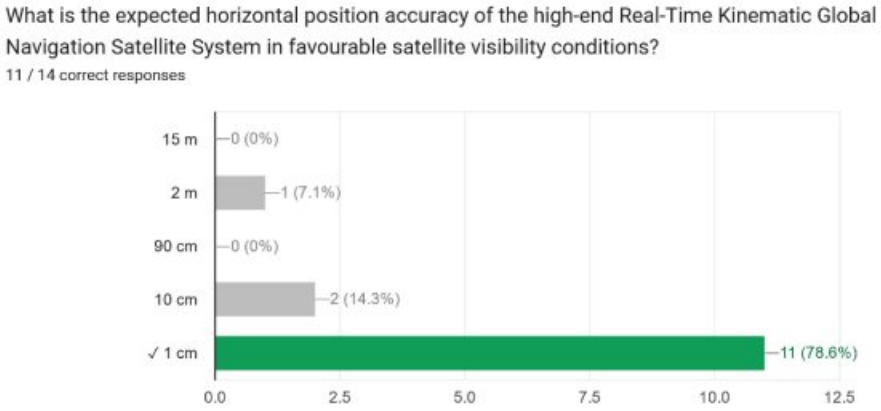
Signature_____ Date_____

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824984

6.4 ANNEX IV – Evaluation test

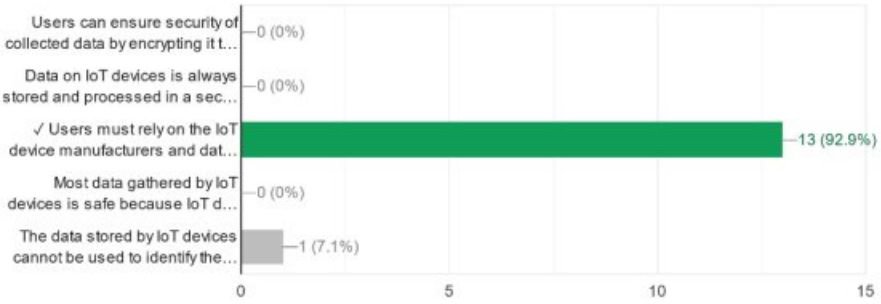






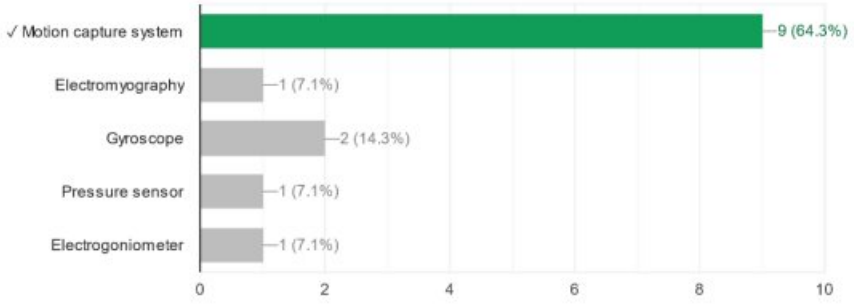
IoT devices gather private information about users. Which statement is most true about the security of that data?

13 / 14 correct responses



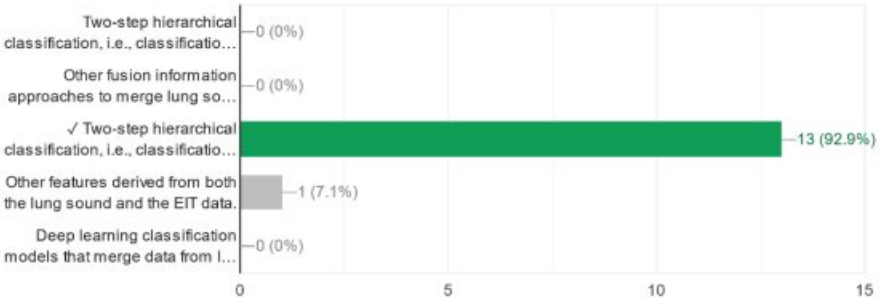
Which one of the following measurement devices is non-ambulatory?

9 / 14 correct responses



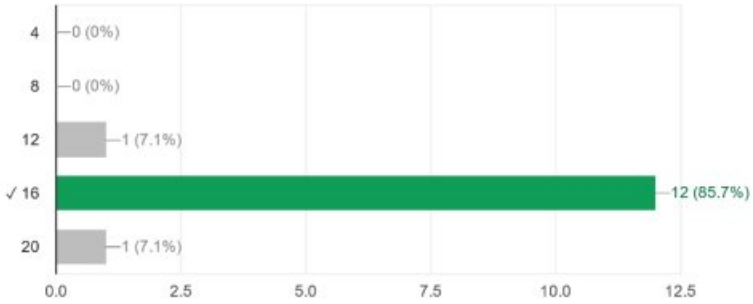
The methods presented in this school have shown that, while the combination of EIT and lung sound features reached an accuracy of 81% when d...ication performance in the four classes problem.

13 / 14 correct responses



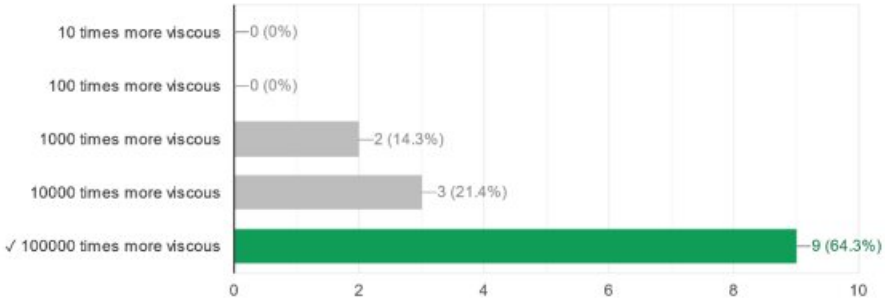
Electrical impedance tomography (EIT) is a medical imaging method that applies very small alternating electrical currents to the human body...e used for EIT examination in the WELMO wearable?

12 / 14 correct responses



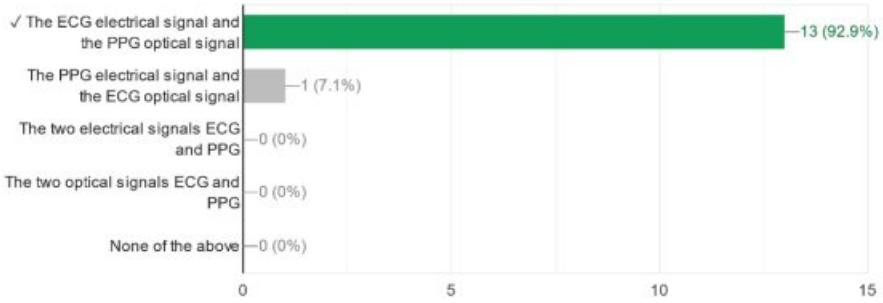
Materials like solder paste and adhesives that are used in electronics production are very thick and viscous pastes. How much more viscous is a stand...e than water,... when the paste is being pumped?

9 / 14 correct responses



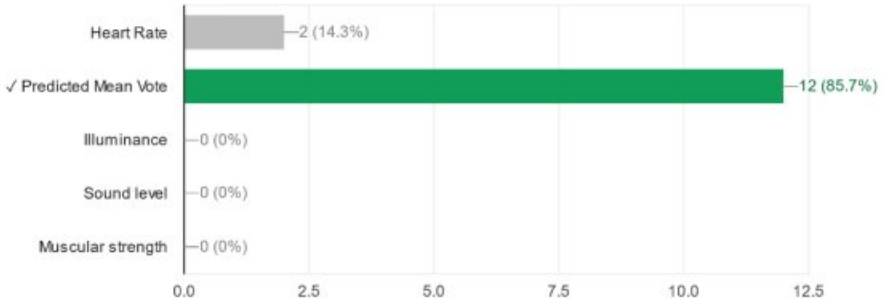
What combination of signals allows the non-invasive estimation of blood pressure in the method used by SINTEC algorithm?

13 / 14 correct responses



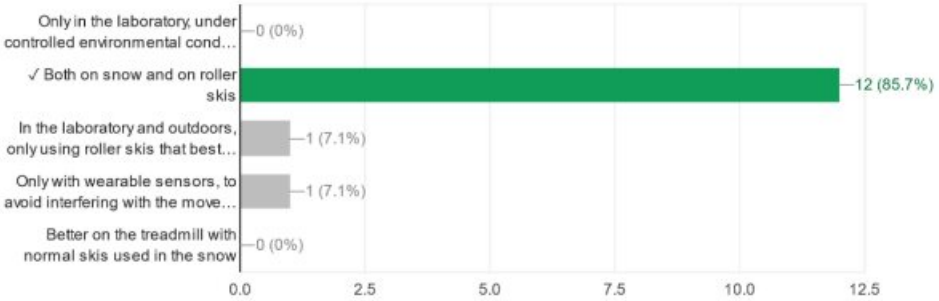
In relation to thermal comfort, what is the index that aims to predict the mean value of votes of a group of occupants on a seven-point thermal sensation scale?

12 / 14 correct responses



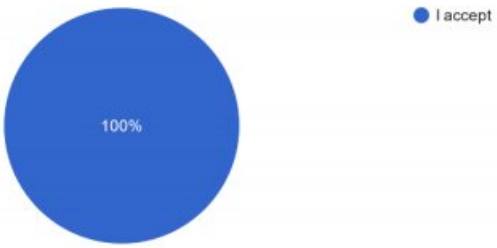
Cross-country skiing can be studied:

12 / 14 correct responses



All data collected by SINTEC Summer School will not be shared with any third part. User data collected in this form shall be used for the purp...s and networking actions of SINTEC Summer School

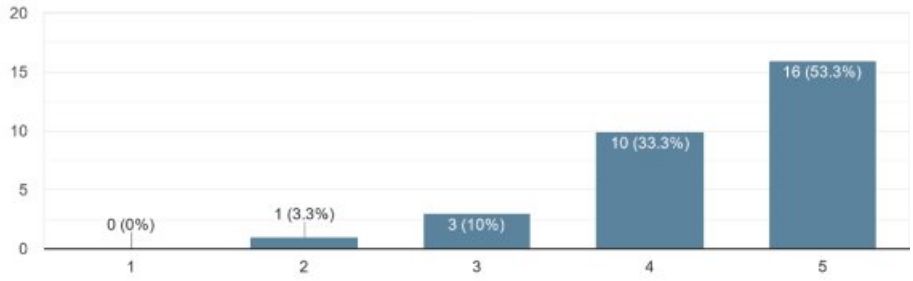
14 responses



6.5 ANNEX V - Feedback Form Results

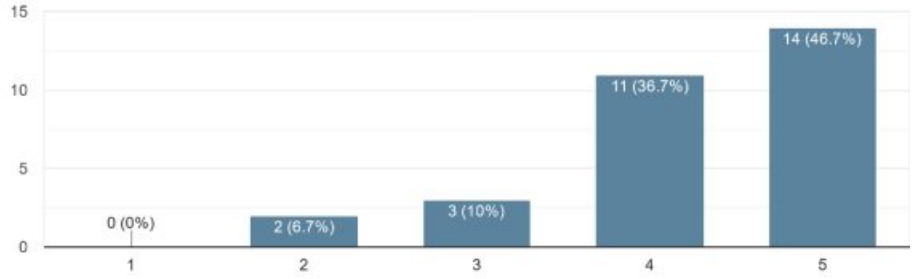
The School broadened the understanding of concepts and principles in the field of wearables and bioelectronics.

30 responses



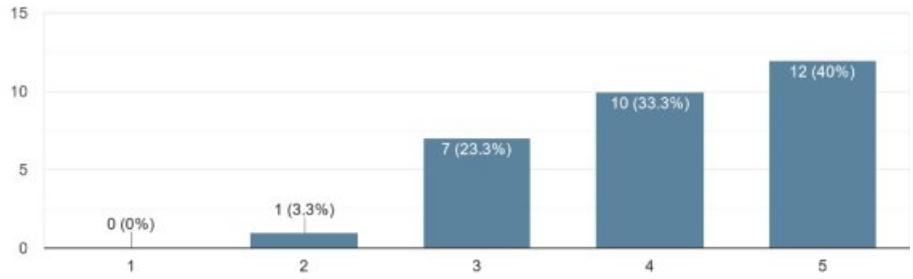
The School provided inputs to carry out original research/work in the field of wearables and bioelectronics.

30 responses



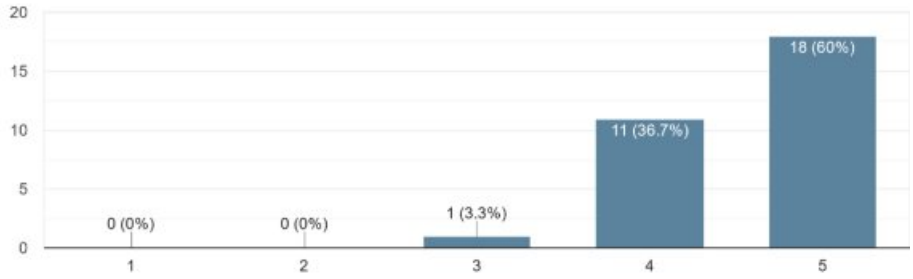
The material presented in the School was relevant to your research/work

30 responses



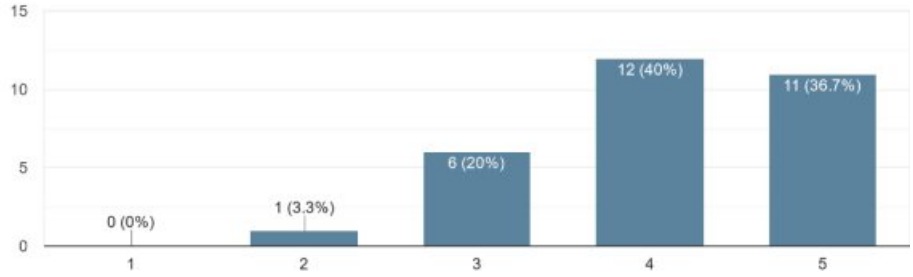
Speakers knowledge of the presented subjects was of the highest level

30 responses



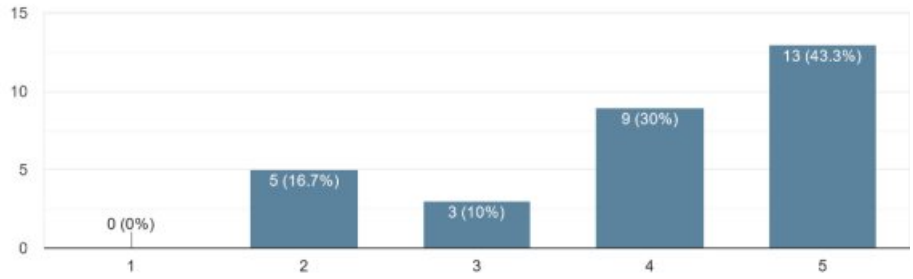
Quality, clarity and level of presentations was of high standard

30 responses



Timing of lectures was appropriate

30 responses



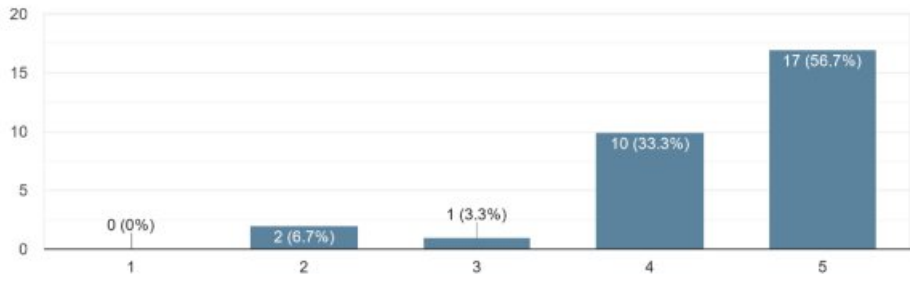
Please, point out the presentation that impressed you the most

15 responses

- Guido Pagana's
- Alessandro Gumiero StMicroelectronics
- Clinical trials for socket comfort analysis...
- SINTEC Project Presentation Prof.Klas Hjort (Uppsala University) and Printing and PCB technology for flexible and stretchable patches Gustaf Mårtensson (Mycronic), Smart Bandage with textile organic biosensors for wearable healthcare Marta Tessarolo (University of Bologna)
- Gustaf Martensson
- Using wearables and Artificial Intelligence to measure personal comfort in living environments
- Barbara's
- Sara Casaccia
- Tessarolo
- Pouyan from Teeside University
- Guido Pagana's presentation
- The last presentation about the chemical sensors
- Gustav Mårtensson, very informative.
- Marta Tessarolo´s presentation about organic biosensors!
- Smart patches and Wearables for clinical applications. Guido Pagana (LINKS Foundation)

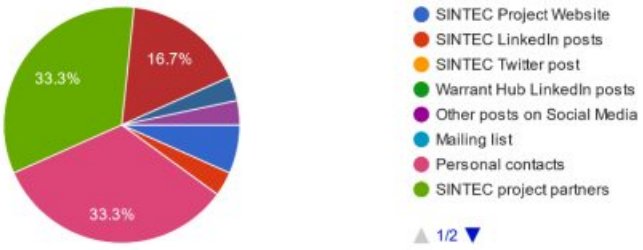
Level of interaction with the audience was appropriate

30 responses



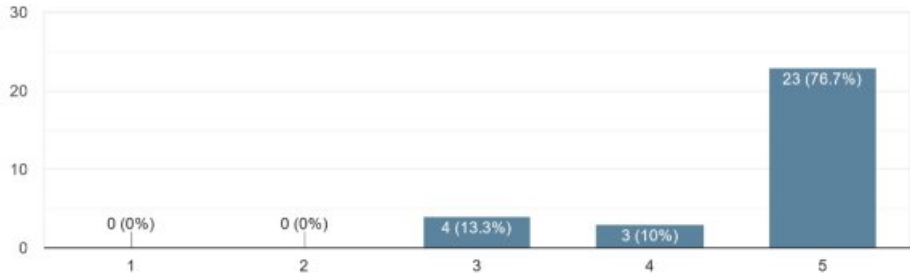
How did you learn about the school?

30 responses



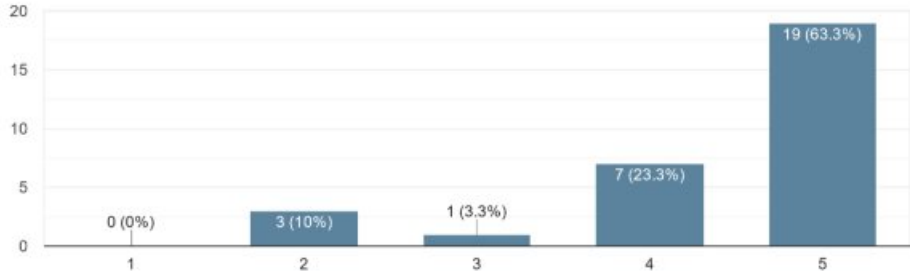
SINTEC School webpage was informative and well organized

30 responses



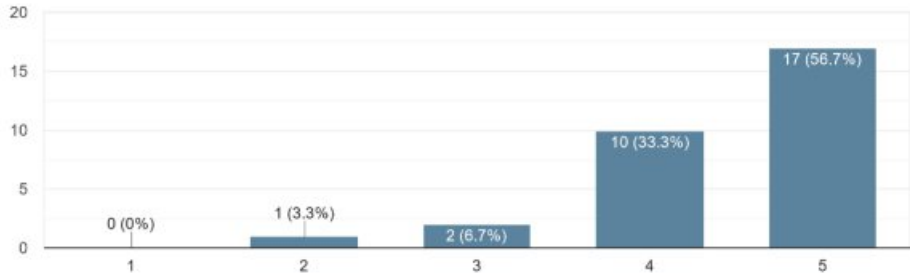
The duration of the School was reasonable

30 responses



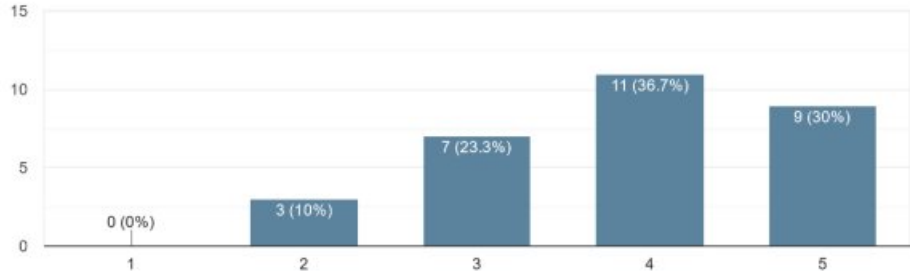
The location was excellent

30 responses



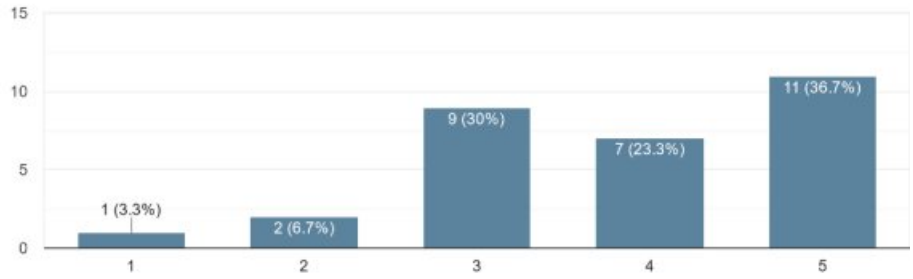
The quality of the sound was excellent

30 responses



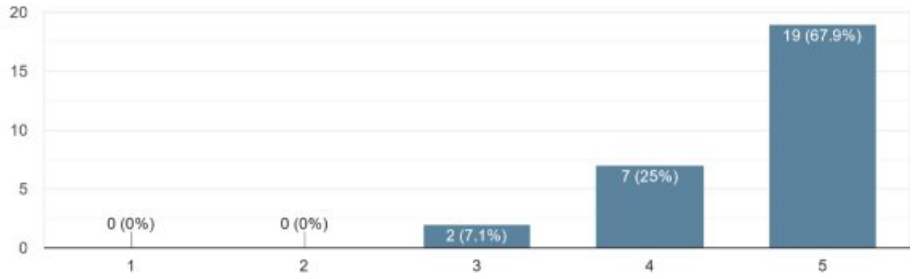
The quality of coffee breaks was excellent

30 responses



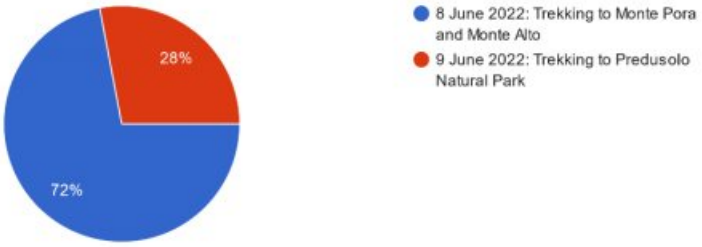
The quality of leisure activities was excellent

28 responses



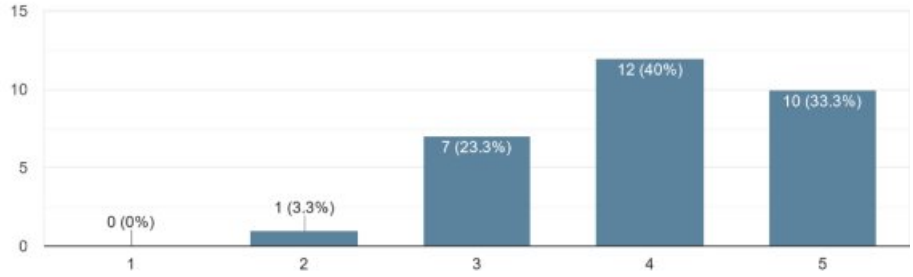
Please, select the leisure activity you enjoyed the most:

25 responses



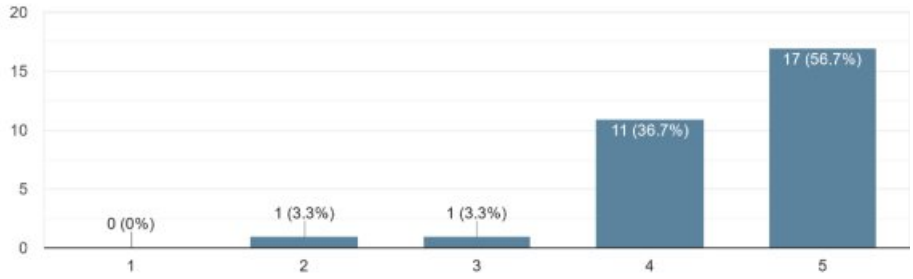
The Summer School addressed your training needs

30 responses



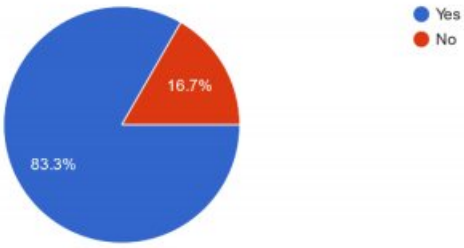
Overall the Summer School met my expectations

30 responses



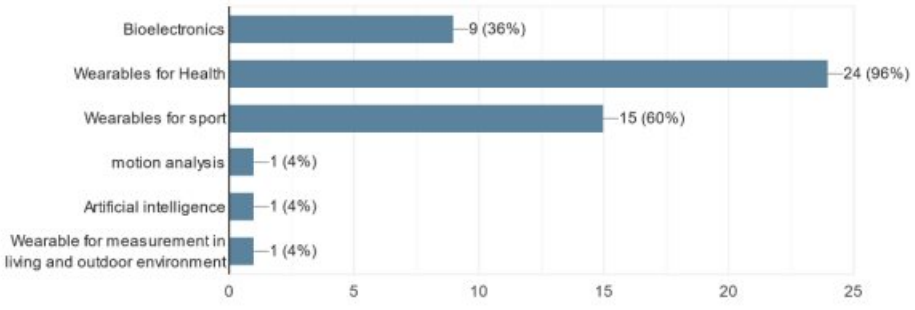
Are you interested in being contacted for workshops to investigate future call for proposals Horizon Europe?

30 responses



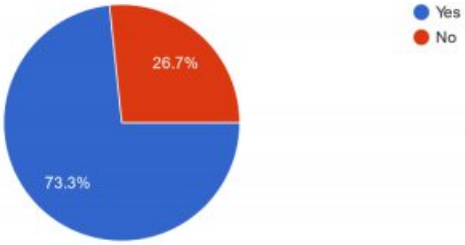
If YES, please, select your area/ares of interest

25 responses



Have you already leave us your suggestions about the Strength, Weakness, Opportunity, and Threat of the SINTEC Smart patch?

30 responses



In your opinion, what are the strengths of the SINTEC smart patch?

5 responses

conformal, comfortable, low height, accurate placement also on places where straps are less suitable, disposable low-cost patch and reusable high-cost module
flexibility and stretchability
Design, features, battery
comfort
comfortable, does not move relative to skin

In your opinion, what are the weaknesses of the SINTEC smart patch?

5 responses

- disposable patch, need cumbersome work to place it and often help from another person
- sticky contact
- Connection issues with the app
- instability
- sweat buildup under patch

In your opinion, what are the opportunities for the SINTEC smart patch?

4 responses

- precise measurements on several places less suitable for straps where the higher costs and cumbersome dressing is accepted, e.g., sports performance and clinical
- patient monitoring
- Multi-disciplinary capabilities
- ease of use, out-of-the-box solution, low technical user knowledge required

In your opinion, what are the threats of the SINTEC smart patch?

4 responses

- too costly and cumbersome or that e-textile provides high enough quality and precision
- none known
- Availability, price
- limited battery life, low data sampling rates

6.6 ANNEX VII – SINTEC Summer School leaflet

SINTEC

SOFT INTELLIGENCE EPIDERMAL COMMUNICATION PLATFORM

SINTEC SUMMER SCHOOL

Smart Bioelectronic and Wearable Systems

7-10 June 2022 | CASTIONE DELLA PRESOLANA (Italy)

"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824984"

Warrant Hub
TINEXTA GROUP

UPPSALA
UNIVERSITET

CO-ORGANIZED BY

WELMO

SOCKET SENSE

life champs

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Smart Bioelectronic and Wearable Systems Summer School

Four days of science and relax on the Italian pre-alps to discover the latest updates about stretchable electronics devices for sport and healthcare.

SINTEC project, started in January 2019 and funded by the European Commission under the Horizon 2020 programme with almost 4 million euros, is organizing a Summer School with the aim of sharing the SINTEC project latest achievements, presenting and testing the first stretchable smart patch prototype and exchanging knowledge with students, researchers, and professionals of the wearable electronics sector.

The aim of the school is to show the novelties SINTEC project will bring to the Wearable sensors sector and networking with companies and other European funded projects to discover future opportunities for the stretchable electronics market. Speakers will present how a classic PCB technology can be turned into a stretchable smart patch, how this sensor can communicate with the latest IoT technologies and why this innovative research can be useful for healthcare and sport monitoring.

The lectures will be organized in two sessions during the day: first, general overviews will be presented by key-note scientists and European industry leaders; then, case studies from EU funded projects WELMO, SocketSense and LifeChamps that supports the event for the scientific program and more applicative issues will be showcased. The event, co-organized by Warrant Hub and Uppsala University, will be participated by high level professionals and researchers. Daily tours at open air and relaxing moments will be offered to test the SINTEC stretchable smart patch, to enjoy participants' stay and to forge new relationships among participants.

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Klas Hjort

SINTEC Project Coordinator

Prof. Hjort is experienced in advanced microengineering. Recently, his focus has been heterogeneous microsystems on stainless steel, flexible foils and elastic substrates; for biomedicine and wireless sensor and actuator nodes. He is co-ordinator of the H2020 projects SINTEC on soft and stretchable printed circuit boards for wireless smart patches and SOMIRO on autonomous swimming soft micro robots that only require energy from the sun.

UPPSALA
UNIVERSITET

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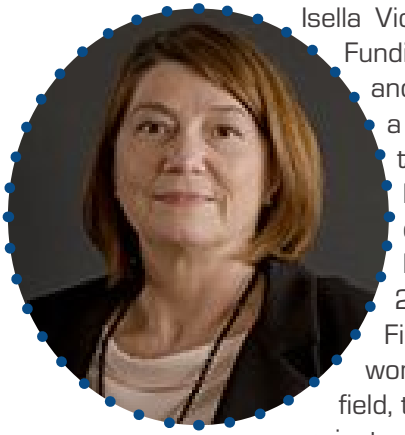
Isella Vicini

SINTEC Project Manager



Isella Vicini is the Director of the European Funding Development of Warrant Hub S.p.A and the CEO and founder of beWarrant, a Belgian consultancy company that provides support on European Funding opportunities. She has a wide experience in the EC Research and Innovation programmes, like Horizon 2020 and LIFE Programme. Since the First Framework Program (1985), she works in the European Project Design field, taking care of the complete cycle of a project: from the analysis of the sectorial policies to the conclusion of the research and innovation project. She currently manages a team of 16 people and her European Funding Development provides 80 consultancy services per year, it is involved in 51 projects and it manages 151 million euros Horizon 2020 grant. Isella is the Project Coordinator of the EU funded project Repair3D and the founder and Dissemination Manager of ECHOES, the EC Cluster on Cultural Heritage.

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Agenda

Day 1 - Tuesday, 7th June 2022

From PCB and Printing Technology to Smart Bioelectronics and Wearables

14.00 – 14.10	Welcome: school introduction *Sara Attanà* (Warrant Hub)
14.10 – 14.30	Round table presentation All participants
14.30 – 15.00	SINTEC Project presentation *Prof.Klas Hjort* (Uppsala University)
15.00 – 15.45	Printing and PCB technology for flexible and stretchable patches *Gustaf Mårtensson* (Mycronic)
15.45 – 16.15	Coffee break / Poster Session
16.15 – 17.00	IoT solutions and communication between devices *Hashim Quraishi* (Evalan)
17.00 – 17.45	Sensor Technology for Health and Wellbeing *Alessandro Gumiero* (STMicroelectronics)
17.45 – 18.30	Open discussion *Prof.Klas Hjort* (Uppsala University)
18.30	Closing of the first day school
20.00 - 22.00	Dinner at the Hotel

Day 2 - Wednesday, 8th June 2022

Smart Bioelectronics and Wearables for Sport Monitoring

15.00 – 15.15	**Welcome** *Sara Attanà* **(Warrant Hub)** *Prof.Klas Hjort* **(Uppsala University)**
15.15 – 16.00	**Wearable technologies in winter sports: Physiology and Biomechanics** *Matej Supej* **(University of Ljubljana)** *Hans-Christer Holmberg* **(Luleå University of Technology)**
16.00 – 16.30	**Wearable technology in summer/team sports** *Nina Verdel* **(Mid Sweden University)**
16.30 – 17.00	**Coffee break / Poster Session**
17.00 - 17.30	**Challenges to perform measurements in the laboratory vs. the field: state of the art and perspectives** *Barbara Pellegrini* **(University of Verona)**
17.30 – 18.00	**Fat-IBC: A new paradigm in Body-Area Communication** *Mauricio Pérez* **(Uppsala University)**
18.00 – 18.30	**Open Discussion** *Prof.Klas Hjort* **(Uppsala University)**
18.30	**Closing of the second day school**
20.00 - 23.00	**Dinner at the hotel**

Day 3 - Thursday, 9th June 2022

Smart Bioelectronics and Wearables for Monitoring Health Parameters

14.00 – 14.15	Welcome *Sara Attanà* (Warrant Hub) *Prof.Klas Hjort* (Uppsala University)
14.15 – 15.00	LifeChamps sensing platform and digital biomarkers forn monitoring QoL of older cancer survivors *Antonis Billis* (Aristotle University of Thessaloniki)
15.00 – 15.30	Smart patches and Wearables for clinical applications *Guido Pagana* (LINKS Foundation)
15.30 – 16.00	Coffee break / Poster Session
16.00 – 16.30	Clinical trials for socket comfort analysis and constructing biomechanical models for sensor deployment *Pouyan Mehryar* (Teesside University)
16.30 – 17.00	Analyzing dynamic operational conditions with sensors and models for anomaly detection *Dejiu Chen* (KTH)
17.00 – 17.45	Effective monitoring of lung activity in lung related chronic diseases patients utilizing sound and visual signals in a comfortable wearable setting *Alexis Melitsiotis* (EXODUS) *Nikolaos Beredimas* (Aristotle University of Thessaloniki)
17.45 – 18.15	Open Discussion *Prof.Klas Hjort* (Uppsala University)
18.15	Closing of the third day school
20.00 – 23.00	Gala dinner

Day 4 - Friday, 9th June 2022

General Applications and Perspectives in Smart Bioelectronics and Wearables

09.00 – 09.15 Welcome
Sara Attanà (Warrant Hub)
Prof.Klas Hjort (Uppsala University)

09.15 – 10.00 Non-invasive chest imaging and sound analysis of lung activity validated in 2 clinical studies
A) Electronics and Textiles development
B) Algorithmic development and Visualisation
C) Sound, EIT analysis and validation
Josias Wacker (CSEM)
Rita Paradiso (SMARTEX)
Nikolaos Beredimas (Aristotle University of Thessaloniki)
Bruno Rocha, Diogo Pessoa (University of Coimbra)
Inez Frerichs (Kiel University)

10.00 – 10.45 Round-table – potential exploitable results and commercial perspectives
Sergio Guillen (MySphera)

10.45 – 11.15 Coffee break / Poster Session

11.15 – 11.45 Using wearables and Artificial Intelligence to measure personal comfort in living environments
Sara Casaccia (Università Politecnica delle Marche)

11.45 – 12.15 Wearable prototype for space and industrial applications
Antonio Del Mastro (Mars Planet Italia)
Filippo Servalli (Radici InNova)

12.15 – 12.45 Smart Bandage with textile organic biosensors for wearable healthcare
Marta Tessarolo (University of Bologna)

12.45 – 13.30 Open discussion – Closing of the school and graduation
Isella Vicini, Sara Attanà (Warrant Hub)
Prof.Klas Hjort (Uppsala University)

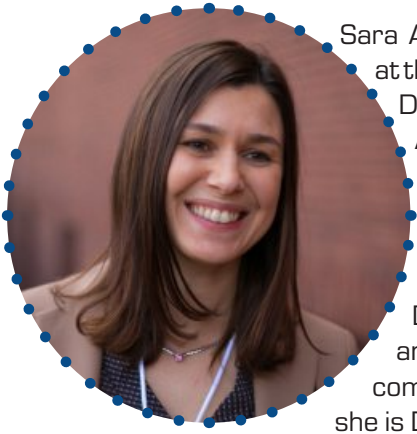
13.30 – 14.30 Light lunch & Farewell

Speakers

Day 1 - Tuesday, 7th June 2022

Sara Attanà

Warrant Hub



Sara Attanà is Dissemination Specialist at the Business Unit European Funding Development of Warrant Hub S.p.A. After a BSc in Communication Science and a Master in Business Management, she has been Marketing and Communications Assistant for Cesari srl and Web Designer, Social Media Manager and SEO Specialist for the IT company ITquadro srl. Since 2017, she is Dissemination and Communication Consultant, Web Designer and Graphic Designer in Warrant Hub.

She's currently involved in the dissemination and communication of more than 50 H2020 and LIFE projects; her activity includes the development of project websites, organization of events and trainings, social media management, graphic design, and EU project reporting. She's the winner of the 2020 .eu web awards for SINTEC project website.

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Gustaf Mårtensson

Mycronic

Gustaf has a M.Sc. in Engineering Physics from the Royal Institute of Technology (KTH) in Stockholm, Sweden. He continued his studies in the realm of fluid mechanics and received his Ph.D. in 2006 from KTH. Gustaf divides his time between rolls as an Expert of Complex Fluids at Mycronic AB and an affiliated researcher at the School of Chemistry, Biotechnology and Health at the Royal Institute of Technology in Sweden.

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Hashim Quraishi

Evalan

Hashim Quraishi has a passion for designing solutions to improve the user's quality of life. He has previously combined his background in mechanical and biomedical engineer to design various mechanisms and medical products such as exoskeletons and prosthetics. Currently he is active as a firmware engineer with a primary focus on the Internet of Things.

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SINTEC

Alessandro Gumiero

STMicroelectronics

Alessandro Gumiero was born in Moncalieri, Italy in 1985 and received the Laurea degree in Electronic Engineering from Politecnico of Turin, Italy in 2011. During the last year of his studies he joined the SRA laboratory of STMicroelectronics, where he developed his skills in electronic design and acquired new expertise in the analysis of biological signals. His research focused on the detection of the PhotoPlethysmoGraphy (PPG) signal on the wrist in motion condition, both with traditional techniques and, recently, with more innovative sensors, like single photon avalanche diodes (SPADs) and SPAD cameras. Currently, he is, within the SRA Remote Monitoring Team, the responsible of the electronic and mechanical part and co-responsible of the algorithm part for the development of innovative patches for ECG and BIO signals monitoring. He also explored electroencephalography (EEG) acquisition and processing through wireless, high density, multichannel devices. He collaborates, in his research activities, with academic and industrial partners, also in the context of national and international funded projects. He is inventor of 1 granted patent and (co-)inventor of other 2 patented application. His research is always oriented to promote and simplify the usage of medical instrumentation to enable a reliable BIO signals remote monitoring and improve the quality of life of the people reducing at the same time the cost of the public facilities.

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Day 2 - Wednesday, 8th June 2022

Matej Supej

University of Ljubljana

Dr. Matej Supej is a professor of Sport Science-Kinesiology, head of the Laboratory of Biomechanics and head of the research programme at the Faculty of Sport, University of Ljubljana, Slovenia. He is also a guest professor at the Department of Health Sciences at Mid-Sweden University. He has an interdisciplinary background with a B.Sc. in Physics, an M.Sc. in Mechanical Engineering, and a Ph.D. in Sport Sciences. He is a former elite alpine skier, a member of the National Alpine Ski Team and Demo Team, and currently a member of the Technical Advisory Board of the Slovenian Ski Association. His research, which has been recognized with two national awards for scientific excellence, an international innovation award, ~100 scientific papers, several invited lectures and presentations, focuses mainly on the biomechanics of human movement, advances in wearable technologies and other measurement technologies, especially for optimizing sports performance, sports equipment and reducing the risk of injury.

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Hans-Christer Holmberg

Luleå University of Technology

Hans-Christer Holmberg is Professor at Luleå University of Technology. He is also affiliated with Karolinska Institute in Stockholm, Sweden, and the University of British Columbia in Vancouver, Canada, as a senior researcher.

He founded the Swedish Winter Sports Research Centre in 2006 and acted thereafter as its Director until 2015. Holmberg's research focuses primarily on cross-country and alpine skiing, using integrated physiological and biomechanical characterization, both in the laboratory and field, to elucidate mechanisms and improve performance. His multiple disciplines of interest within physiology include muscle function, circulation, respiration, and metabolism, while his biomechanical approaches include kinetics, kinematics and electromyography, with special emphasis on novel technology.

He has also carried out research on other sporting disciplines (e.g., cycling, running, swimming, orienteering, soccer) and his present total of more than 220 publications in peer-reviewed scientific journals, in addition to several book chapters, includes a growing number on physical activity and health, as well as on the utilization of wearable sensor technology.

Dr. Holmberg is also Director for Research & Development at the Swedish Olympic Committee (2005-present).

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Nina Verdel

Mid Sweden University

Nina Verdel is employed at the Mid Sweden University and the Faculty of Sports, University of Ljubljana, Slovenia. Within the SINTEC (Horizon) project, she is working at Mid Sweden University on the development and validation of a new sensor - SINTEC smart patch (biomechanical and physiological parameters). At the Faculty of Sport she is doing research in the field of biomechanics.

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Barbara Pellegrini

University of Verona

Barbara Pellegrini is currently associate Professor of Sport Science at the University of Verona, and teaching by the Master's degree in Sports Science and Physical Performance, University of Verona and Trento, Italy. She earned her Master Degree In Physics at University of Trento in 1999, and her PhD in Physical Exercise and Human Movement Science from the University of Verona in 2012. She is in the Department of Neuroscience, Biomedicine and Movement Science, and her research activity is mainly carried out in the laboratories of CeRiSM, Research Center for Mountain Sports and Health, of the University of Verona.

Her main research interests are in the field of biomechanics and physiology of sport, human exercise and locomotion in the field of endurance sport, with a special focus on cross country skiing. She has conducted several projects by collaborating also with international groups with the aim to deepen the knowledge of the biomechanics and energy of cross country skiing. Her research interests include Nordic Walking. From 2005 to now she is involved in the evaluation test of the Italian Cross country ski teams. From 2010 to now, she is involved in collaborations with sports companies, in projects aimed at testing sports garments and equipment for sports.

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Mauricio Pérez

Uppsala University

Dr. Mauricio Pérez was born in Buenos Aires, Argentina, on 25 July 1980. He received the engineering degree in Electronics from the National Technological University (UTN) in Argentina in 2007. He obtained the PhD in Electrical Engineering at University of Bologna (UNIBO) in Italy in 2012. He had experiences in the industry as a researcher in Italy from 2012 to 2014 and from 2014 he is a collaborator with National Technological University (UTN) of Argentina in teaching and research. Currently, he is a researcher at the Microwaves in Medical Engineering Group at Engineering Sciences Department of Uppsala University (UU) in Sweden. His research interests are microwave passive technologies and advanced applied mathematics for biomedical applications.

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Day 3 - Thursday, 9th June 2022

Antonis Billis

Mid Sweden University Aristotle University of Thessaloniki

Dr. Antonis Billis holds the position of the PostDoc Research Fellow at the Lab of Medical Physics and Digital Innovation. He received his diploma in Electrical and Computer Engineering in 2007 and MSc in Medical Informatics in 2011, both from Aristotle University of Thessaloniki, Greece. Finally, he obtained in 2020 his PhD entitled “Digital biomarkers as ecologically valid measures for the remote and longitudinal assessment of older adults health”. His main research interests lie in the areas of sensors, remote health monitoring, medical decision support systems, smart hospital applications, mHealth, AAL technologies and Living Labs. He has authored/co-authored numerous papers in conferences and peer-reviewed journals (for a complete list of references please see https://scholar.google.com/citations?user=z-dP1t4AAAAJ&hl=en&oi=ao) and has also participated in several European and national research projects related to digital health. He is currently coordinating scientifically the LifeChamps (A Collective Intelligent Platform to Support Cancer Champions) and IntelTriage (Intelligent triage system for hospital emergency departments and clinics) projects. Finally, he has been a member of the technical chamber of Greece since November of 2007.

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Guido Pagana

LINKS Foundation

Dr. MD Ing. Guido Pagana received the degree in Engineering from Politecnico di Torino and Paris Supelec in 2000 and in MD from University of Torino in 2006, Ph.D. in Electronics Engineering in 2009 on microwave imaging for breast cancer detection. He is both engineer and medical doctor collaborating with hospitals in Torino area. He joined the Department of Control and Computer Engineering as Research Engineer working on algorithms for biomedical data analysis. His research field covers elderly medicine, telemedicine, telemonitoring, analysis of cardiological signal and microwave imaging. Since 2003, he has worked as a researcher at Links Foundation in Torino.

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SINTEC

Pouyan Mehryar

Teesside University

Pouyan Mehryar is currently a Postdoctoral Researcher in Artificial Intelligence at the Healthcare Innovation Centre (HIC) of Teesside University based in The Welding Institute, Cambridge/UK. He obtained his Master of Engineering (MEng) with first-class honours (within-top 1%) in Mechanical and Medical Engineering from the University of Hull, UK. He received his PhD degree from the institute of Design, Robotics and Optimisation (iDRO), School of Mechanical Engineering at the University of Leeds, UK, in 2018. After obtaining his PhD, he became a Postdoctoral Research Fellow in iDRO working on the Development of Intelligent Control for a Wearable Soft Robotic System. Following that, he was appointed as a Postdoctoral Teaching Fellow responsible for teaching Biomechatronics and Medical Robotics to master students, which mainly involved the use of Artificial Intelligence (i.e., machine learnings techniques) in robotic applications. Pouyan Mehryar also worked on different Innovate UK projects, which involved Quick fitting of prosthetic sockets for above-knee amputees (QuickFit), the development of a prototype wheelchair system that uses internet of thing (IoT) biophysical sensors for AI healthcare monitoring to support the independence of elderly patients (iChair) and AI-based solution for the detection and characterisation of lesions in breast MRI (Intelliscan) as a postdoctoral research associate at the HIC, UK. His research interests lie in the areas of Biomechanics, Clinical Movement Analysis, Neuro-Engineering, Assistive and Rehabilitative Robotics, Artificial Intelligence, Multibody Dynamics and Biostatistics.

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His previous research focused on the neuromuscular coordination strategy of lower limb amputees from a biomechanics and robotic control perspective. Subsequently, He has been involved in developing intelligent techniques and devices for a wide range of applications in Medicine, Assistive and rehabilitative technologies, Healthcare and Gaming. He has worked on several research projects with universities and institutes worldwide, all of which have yielded high-quality publications.

Dejiu Chen

KTH Royal Institute of Technology

Dejiu Chen is a Docent and Associate Professor in Embedded Control Systems, with the Mechatronics and Embedded Control Systems Division and Digital Futures Faculty, of KTH Royal Institute of Technology, Sweden. His research interests are in the areas of embedded control systems (ECS), cyber-physical systems (CPS), and system-of-systems (SoS), with active research on: 1. Engineering methods and tools; 2. Architecture design and system integration; 3. Safety engineering for trustworthiness; and 4. Design of self-X properties for anomaly treatment and operation optimization. He has worked for Enea Data AB, Sweden, as a senior technical instructor during 2007~2009. Dejiu Chen is currently the PI for EU H2020 research project SocketSense on AI centric medical IoT, and the KTH PI for EUREKA EURIPIDES2 research project TRUST-E on the reliability of AI platforms. Dejiu Chen is a senior member of IEEE. For more information: https://www.kth.se/profile/chendj

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Alexis Melitsiotis

EXODUS

Alexis Melitsiotis is an R&D Project Manager and a Physicist graduate from the Physics Department of University of Crete. He completed his Postgraduate studies in “Physics and Technological applications” in 2015 at the National Technical University of Athens and his dissertation was related with the magnetotransport properties of multilayered thin films. In 2014 he joined the INN of NCSR Demokritos as a junior researcher and since then he has participated in 7 European, industrial oriented Research projects (FP7 & Horizon2020) for Research Centres and SMEs.

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Nikolaos Beredimas

Aristotle University of Thessaloniki

Nikolaos Beredimas has been involved in national and international eHealth research projects in the Aristotle University of Thessaloniki (Laboratory of Computing, Medical Informatics and Biomedical - Imaging Technologies) for the past ten years, in a multitude of roles including Requirements Elicitation & Analysis, Software Development, Systems Engineering, and System Security. His main areas of interest are in Health Data Storage and Representation, Semantic Data Representation, and in Clinical Decision Support Systems. He holds a Diploma in Electrical & Computer Engineering (University of Patras), a MSc in Medical Informatics (Aristotle University of Thessaloniki), and a Master of Public Administration (International Hellenic University).

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Day 4 - Friday, 10th June 2022

Josias Wacker

CSEM

Dr. Josias Wacker holds an MSc in biomedical engineering (2007) from the Swiss Institute of Technology, Zurich (ETHZ) and a PhD in microtechnology (2012) from the Swiss Institute of Technology, Lausanne (EPFL). He joined CSEM in 2014 where he develops ergonomic, skin-friendly housings for sensors which measure body signals. He has managed R&D projects on a national and international level.

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Rita Paradiso

SMARTEX

Rita Paradiso graduated in Physics from the University of Genoa and received her Ph.D. in Bioengineering in 1991. Molecular Electronics, Biosensors, Biomaterials for biomedical applications have been her main research topics. In particular she worked on functionalized surfaces and their characterization. She worked in London during the Ph.D. at the Physics Department of Queen Mary College. In 1993 she got a Post Doctor CE fellowship, at the Molecular Chemical Laboratory - CNE Saclay, France. In 1994 she was Post Doctor fellow at the Department of Material Engineering of the University of Trento. During 1998, she worked at the "IRST-Instituto Trentino di Cultura" on bio-activation of MEMS, FIBIA. From 1998-1999 she was Research Manager of Technobiochip s.r.l.- Marciana (LI)-Italy.

She has over 60 scientific publications and conference presentation since 1989, H index 27, i10 index 54 (google scholar). She joined Smartex in 2000 as R&D Manager, and from July 2011 is the CEO of the company.

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From September 2001 was the coordinator of WEALTHY (IST-2001-37778), from January 2004, was working in MYHEART an Integrated Project (IST- 2002-507816) as coordinator of “Functional Bioclothes” consortium and is now working in Psyche (ICT-247777) as technical coordinator. She has a wide experience in national and international research projects, as e-textile expert. She is currently working in WELMO (H2020 825572), TACTILITY (H2020 856718) and SIXTHSENSE (H2020 883315). She won AVANTEX Innovation Prize 2005 Healthcare, she got the Paper Award for IEEE: Transactions on Information Technology in Biomedicine, 2010 EMBS an the Excellent Paper Award in year 2010 for Research Journal of Textile and Apparel.

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Bruno Rocha

University of Coimbra

Bruno Rocha is a PhD student at the Department of Informatics Engineering of the University of Coimbra and member of the Adaptive Computation research group at the Centre for Informatics and Systems of the University of Coimbra (CISUC). His main research interests are in the areas of respiratory sound analysis and music computing. Since completing his master degree in Sound and Music Computing in 2011, Bruno Rocha has participated in several research projects. In 2012 he was a researcher at the University of Amsterdam, where he devised a structural segmentation algorithm and a timbre similarity measure for electronic dance music. In 2013, he moved to the University of Coimbra to study music emotion recognition, focusing on the development of novel features stemming from the analysis of melody and rhythm. From 2015 to 2017, Bruno Rocha was a member of the WELCOME project, developing signal processing algorithms for the detection and classification of cough. That project has been followed by WELMO, where he focuses on the analysis of adventitious respiratory sounds. The common research topic in all those projects has been the combination of audio signal processing and applied machine learning. In 2018, he was attributed a doctoral grant by the Portuguese Foundation for Science and Technology. Since 2012, Bruno Rocha has published in several conferences and journals of music research and health informatics.

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Diogo Pessoa

University of Coimbra

Diogo Pessoa is a doctoral student in Informatics Engineering at the Centre for Informatics and Systems of the University of Coimbra (CISUC). He is also a member of CISUC's Adaptive Computation research group. His doctoral work concerns the development of automatic algorithms, mostly machine learning-based, to monitor the respiratory function using Respiratory Sound and Electrical Impedance Tomography. In 2019, he concluded his Integrated master's in Biomedical Engineering at the University of Coimbra, with specialization in Bioinformatics and Clinical Informatics. In 2020, he was attributed a doctoral grant by the Portuguese Foundation for Science and Technology. His main research interests include the development of machine learning models applied to medical informatics and signal processing. More information can be found at https://www.cisuc.uc.pt/en/people/d-pessoa.

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Sara Casaccia

Università Politecnica delle Marche

Sara Casaccia is Assistant Professor of Mechanical and Thermal Measurements at the Department of Industrial Engineering and Mathematical Sciences of Università Politecnica delle Marche. She received her Master degree (cum laude) in Biomedical Engineering in 2011 at Università Politecnica delle Marche (Italy) and her Ph.D in Mechanical Engineering in 2015 in the same institution. She attended the department of Electrical and System Engineering of the Washington University in Saint Louis (Missouri-USA) for a period of 7 months during her Ph.D. Her research focuses on sensors and measurement techniques for supporting people in build and living environments (e.g. comfort, wellbeing), data processing to extract complex information (e.g. using AI), sensors for biomedical applications and non-destructing techniques.

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Antonio Del Mastro

Mars Planet Italia

Antonio Del Mastro is an Electronic/ Telecommunication Engineer with a long experience in the design, risk analysis techniques and certification of devices and systems in the Space and not-Space industry. He is is currently President of Mars Planet (www.marsplanet.org), a private organization member of the International Astronautical Federation focused on the research on human exploration of Space. His main areas of research interest are related to virtual reality, space medicine, robotics, AI. Antonio is the president of the Italian Mars Society which he founded in 2004, as an Italian branch of the International Mars Society and Technical Director of Mars Planet Technologies, a Space company focused on the development of terrestrial applications of Space Research. Currently, he is a member of the working group Science and Technology for Digital Earth of the International Society of Digital Earth (ISDE).

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Filippo Servalli

Radici InNova

Filippo Servalli is Radici Group Corporate Innovation&Research Manager, in the past Marketing Director and Sustainability Manager at Radici Group, one of the most active Italian chemicals companies at an international level. Mr Servalli joined the Radici Group in 1992 as Marketing Manager at Radici Novacips S.P.A., and he previously worked at Acerbis Italia as an R&D specialist. President of the Federchimica “Responsible Care” commission. Member of the UNI and ISO Circular Economy working group.

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Marta Tessarolo

University of Bologna

Marta Tessarolo received the PhD (2016) in Physics at University of Bologna. In her career, she worked in Area Science Park – Trieste developing advanced technologies for cancer diagnostics. Then she moved to the National Research Council (CNR) in Bologna focusing her research on flexible organic solar cells. Recently, she got a post-doc position in University of Bologna, Department of Physics and Astronomy and in the field of wearable textile biosensors based on polymer semiconductors. Nowadays, she wrote more than 40 papers on international scientific journals, attended to many international scientific conferences, she followed the technology transfer on several research projects on textile and flexible biosensors.

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Inéz Frerichs

Kiel University

Dr. Inéz Frerichs is a Professor of Physiology at the Christian Albrechts University in Kiel, Germany. She is the head of the Electrical Impedance Tomography (EIT) research group at the Department of Anaesthesiology and Intensive Care Medicine at the University Medical Centre Schleswig-Holstein, Campus Kiel, Germany. In her scientific career, she has been involved with different aspects of lung-oriented research (e.g. gas transport in the lungs, high-frequency oscillation ventilation, respiratory mechanics, functional lung imaging, wearable lung monitoring). She has published 191 original articles (143 on EIT), 15 reviews and 21 book chapters.

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Sergio Guillen

MySphera

Graduate in Electronic Engineering (1976) and Doctor of Telecommunications (Polytechnic University in Valencia, UPV, 1988). He has worked for more than 10 years as Research Fellow of the National Scientific Council (CONICET) of Argentina and as Assistant Professor in the University of Tucumán (Argentina) in the field of Biomedical Engineering and Medical Instrumentation. Since the beginning of his professional career he as combined both, academic and research activities and entrepreneurial undertakings. In 1998, he created the TSB Research Group, "Tecnologías para la Salud y el Bienestar" at the UPV. In 2000, he co-founded the ITACA Research Centre within the UPV where the TSB Research Group is currently ascribed. He has participated in more than 20 V, VI and VII Framework Programme R&D projects in the e-Health and e-Inclusion fields. Worth to mention are PIPS (IP VI FP project), My HEART (IP VI FP project) and SENSATION (IP VI FP Project). He has been technical coordinator of the PERSONA (IST- VI FP project) and Technical Manager of universAAL (IP VII project). He has been member of the management board in HEART CYCLE, OASIS, METABO and VAALID (all VII FP projects) as well as member of the advisory board in Heartways (Research for SMEs - VII FP Project) and MOSAIC (ICT – VII FP project). Currently he is Deputy Project Coordinator of H2020 LSP ACTIVAGE. He is Chief Innovation Officer of MYSPHERA.

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“Our greatest glory is not in never falling, but in rising every time we fall - Confucius”

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“You must do the things you think you cannot do - Eleanor Roosevelt”

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“Success is not always the accompaniment only of victory, but also of the desire for victory - Friedrich Nietzsche”

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“Stay close to anything that makes you glad you are alive - Hafiz”

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“Life is too short to be working for someone else’s dream - Hugh Hefner”

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“Change your life today. Don’t gamble on the future, act now, without delay - Simone de Beauvoir”

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“To accomplish great things, we must not only act, but also dream; not only plan, but also believe - Anatole France”

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