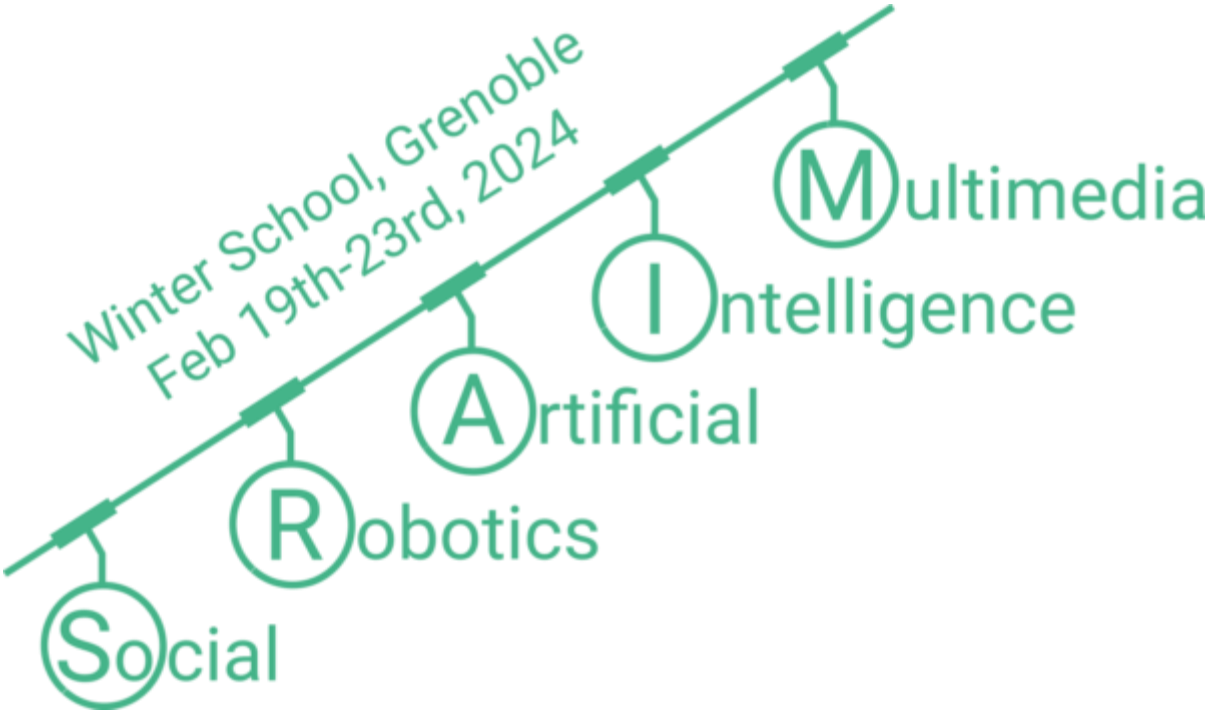
This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 871245.



A SPRING project initiative

SoRAIM Winter School Participants Booklet

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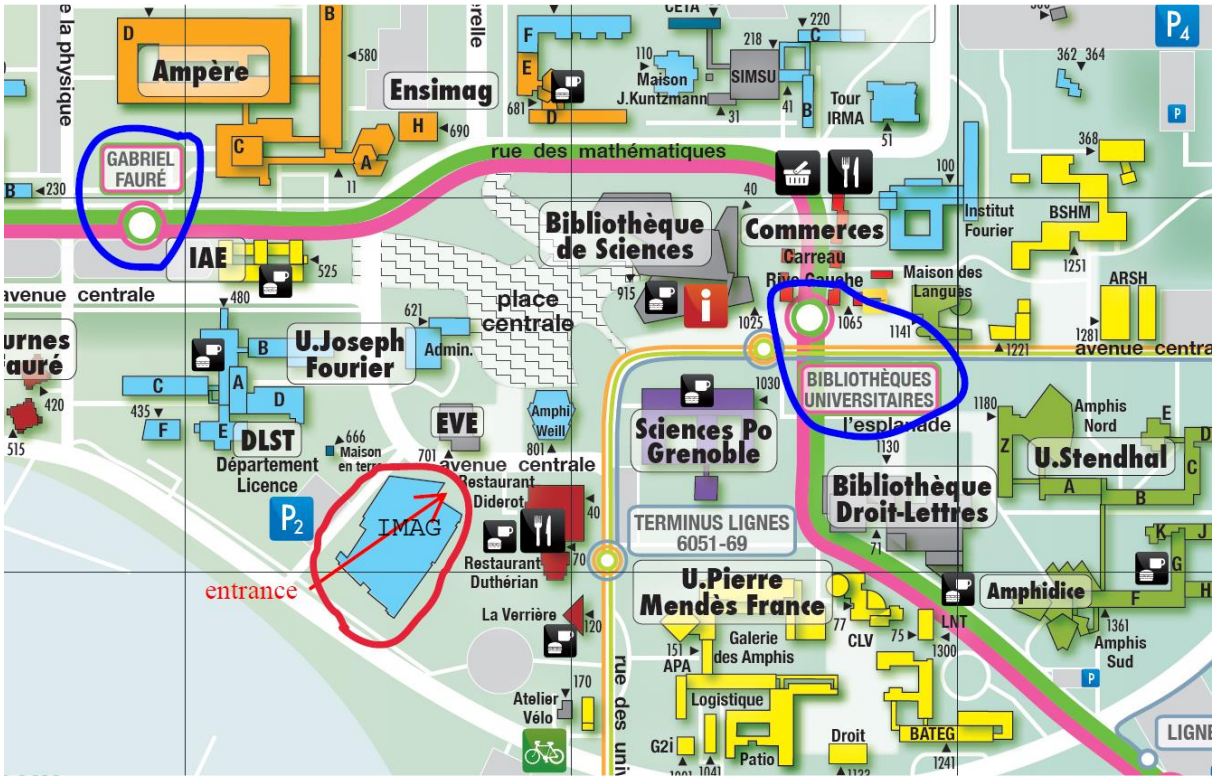
KEY INFORMATION

VENUE

The venue is the IMAG building on Grenoble's Campus. The exact address is Bâtiment IMAG, Université Grenoble Alpes, 150 place du Torrent, Domaine Universitaire - 38401 St Martin d'Hères. There is ample parking available for cars and bicycles around the building. Further details about how to reach the building are available here, although only in French.

A rough map of the campus, with the IMAG building circled in red and the two closest tram stations circled in blue (Grabriel Fauré ; Bibliothèques Universitaires) is displayed hereafter.



All of the sessions will take place on the ground floor of the building: main auditorium for the plenary sessions, seminar rooms and hallway for the demonstration, poster and hands-on sessions).

REGISTRATION DESK

Upon arrival you should go to our registration desk, where you will be given your name badge. We will set it up from 13:45 on Monday 19 so as for all to have ample time to get it before the start of the first session. For any queries once on-site you should ask the staff at the registration desk, in their absence you can email soraim@inria.fr.

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PARTICIPANTS WITH POSTERS

Participants who have submitted a poster abstract should come to the school with their poster readily printed, format A0 portrait preferred. Poster stands, clips and tape will be made available to facilitate their display.

SOCIAL PROGRAMME (TUE 22)

Social programme: on Thursday afternoon you have the choice between two different guided visits of the city of Grenoble. Details of the programme are given hereafter. You must register for those (30 slots only for each) through this form.

HANDS-ON SESSIONS (FRI 23)

On Friday morning and afternoon will take place, in parallel, five different hands-on sessions. These consist in: a navigation simulation (lead: INRIA); a use case of the people identifier/manager (lead: PAL Robotics); a prompt engineering building conversational system with LLM (lead: HWU); a localisation trial (lead: CVUT); a speaker extraction use case (lead: BIU). You need to register for these (10 seats maximum per hands-on session; you can register for a maximum of two sessions) here.

Hands-on sessions require that you bring your own laptop and that you have downloaded beforehand the packages that will be used during the sessions (links sent separately).

LUNCH / COFFEE BREAKS

- Coffee and light snacks are provided during the breaks in the hallway
- Lunch is not covered by the school : there are two large university restaurants right next to the IMAG building as well as smaller restaurants around the tram stop *Bibliothèques Universitaires* (see map on previous page)

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RATIONALE, ORG., AND SPONSORS

RATIONALE

The Social Robotics, Artificial Intelligence and Multimedia (SoRAIM) multi-disciplinary winter school combines topics of interest to the next generation of social roboticists. Top-level invited speakers will introduce and discuss all relevant areas for building socially aware robots that communicate and interact with humans in a shared space. Lectures will cover the following topics:

- Speech source localization and separation
- Mapping and visual self-localization
- Social-aware robot navigation
- Tracking and analysis of human behaviour
- Dialog management, natural language understanding, and generation
- Robotic middle-ware and software integration
- Ethics and experimental design

SoRAIM aims to foster discussion between experts in these fields and to expose young researchers and engineers to highly qualified scientists and experts. SoRAIM is organized by the European H2020 SPRING project, which investigates social robotics for multiparty interactions in gerontological healthcare. It will provide opportunity to interact and discuss with several members of the project, to present your own research in the form of a poster, and to participate in wider topic discussions with your peers.
More information about SPRING: https://spring-h2020.eu

ORGANISERS

SoRAIM is organised by all the members of the SPRING project: Institut National de Recherche en Informatique et Automatique (INRIA, France); Universit`a degli Studi di Trento (UNITN, Italy); Ceske Vysoke Ucenı Technicke v Praze (CVUT. Czech Republic); Heriot-Watt University (HWU, United Kingdom); Bar-Ilan University (BIU, Israel); ERM Automatismes Industriels (ERM, France); PAL Robotics (PAL, Spain); Assistance Publique Hopitaux de Paris (APHP, France).

SPONSORS

SoRAIM is grateful for the support provided by its sponsors: INRIA, ACM/SIGMM, MIAI, UGA

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PROGRAMME

The school's programme consists in eight plenary sessions, each dedicated to a specific topic linked to a scientific, technological or regulatory issue that modern social robotics thrives to solve. Each session is thematic: it contains a talk by one (or several) top-level invited speakers for an approximate duration of an hour, and a talk by one of the SPRING project members working on a close topic for an approximate duration of thirty minutes.
These sessions are complemented by an introductory and robot demonstration session (Monday afternoon, followed by a reception); a panel discussion which will delve into the future of the field (on Tuesday afternoon); two poster sessions for participants to exchange on their own research projects (on Wednesday afternoon); and finally, two hands-on sessions to allow participants to try their wits on state-of-the-art problems through group work (on Friday morning and early afternoon).

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SoRAIM Programme	Monday	Tuesday	Wednesday	Thursday	Friday
	Feb 19th	Feb 20th	Fev 21st	Feb 22nd	Feb 23rd
9h00-10h30		**Plenary 01** Invited: Marc Hanheide SPRING: Séverin Lemaignan	**Plenary 04** Invited: Wenwu Wang SPRING: Sharon Gannot	**Plenary 06** Invited: Xuesu Xiao SPRING: Chris Reinke	**Plenary 08** Invited: Hatice Gunes SPRING: Lorenzo Vaquero Otal
10h30-11h00		**Break**	**Break**	**Break**	**Break**
11h00-12h30		**Plenary 02** Invited: Vasiliki Charisi SPRING: Cyril Liotard	**Plenary 05** Invited: Gabriel Skantze SPRING: Daniel Hernandez Garcia	**Plenary 07** Invited: Antonios Gasteratos SPRING: Michal Polic	**Hands-on session 1**
12h30-14h30	Starting 13h45 : **Registration**	**Lunch**	**Lunch**	**Lunch**	**Lunch**
14h30-16h00	**Introduction** Xavier Alameda-Pineda SPRING-ARI demonstration	**Plenary 03** Invited: Raja Chatila & Mihalis Kritikos SPRING: Anne-Sophie Rigaud	**Poster Session**	**Social Activity / Free time (starting 14:00)**	**Hands-on session 2**
16h00-16h30	**Welcome Reception**	**Break**	**Break**		
16h30-18h00		**Panel session** Are social robots already out there? Immediate challenges in real-world deployment	**Poster Session (c'ed)**		

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PROGRAMME DETAILS: MON 19 FEB

INTRODUCTION / ROBOT DEMONSTRATION (14:30-16:00)

Introducing SoRAIM

SPRING speaker: Xavier Alameda Pineda, INRIA

Venue: main auditorium

The week will start by introducing very quickly the participants to the SPRING project and by giving a recap of the week's programme

SPRING-ARI demonstration

Venue: hallway

The robotic platform used for the SPRING project, an ARI model from PAL Robotics, will be displayed in the hallway and a demonstration of some of the modules developed within the project will be performed (including but not limited to: localisation, social navigation, speaker extraction, conversation).

WELCOME RECEPTION (16:00-18:00)

Venue: hallway

PROGRAMME DETAILS: TUE 20 FEB

PLENARY 01 - AUTONOMOUS ROBOTS: ADAPTATION AND SOFTWARE INTEGRATION (09:00-10:30)

Autonomous Robots in the Wild – Adapting from and for Interaction

Invited speaker: Marc Hanheide, University of Lincoln

Venue: main auditorium

Time: 09:00 – 10:00

Abstract: Robots that are released "into the wild" are moving away from the controlled environments and laboratories in which they were developed. They are now forced to contend with constantly changing environments and uncertainty, learn on the job, and adapt continuously and over the long term. The paradigm of long-term autonomy and adaption is what enables the deployment of robots away from factory floors and warehouses where they already are omnipresent into equally challenging and promising application domains. In the winter school course, we will look at how robots can "survive" (operate reliably and effectively) in dynamic environments, ranging from agricultural fields to museums, experiencing slow changes due to seasons and acute uncertainty from interaction with humans. We will look at selected recent robotic developments in mapping, navigation, interaction, and perception and discuss the challenges and opportunities of deploying autonomous robots in the wild.

Bio: Marc Hanheide is a Professor of Intelligent Robotics & Interactive Systems in the School of Computer Science at the University of Lincoln, UK, and the director of the University's cross-disciplinary research centre in Robotics, the Lincoln Centre for Autonomous Systems (L-CAS). He received the Diploma in computer science from Bielefeld University, Germany, in 2001 and the Ph.D. degree (Dr.-Ing.) also in computer science also from Bielefeld University in 2006. In 2001, he joined the Applied Informatics Group at the Technical Faculty of Bielefeld University. From 2006 to 2009 he held a position as a senior researcher in the Applied Computer Science Group. From 2009 until 2011, he was a research fellow at the School of Computer Science at the University of Birmingham, UK. Marc Hanheide is a PI in many national and international research projects, funded by H2020, EPSRC, InnovateUK, DFG, industry partners, and others, as well as the director of the EPSRC Centre for Doctoral Training (CDT) in Doctoral Training in Agri-Food Robotics (AgriFoRwArdS). The STRANDS, ILIAD, RASberry, and NCNR projects are among the bigger projects he is or was involved with. In all his work, he researches autonomous robots, human-robot interaction, interaction-enabling technologies, and system architectures. Marc Hanheide specifically focuses on aspects of long-term robotic behaviour and human-robot interaction and adaptation. His work contributes to robotic applications in care, logistics, nuclear decommissioning, security, agriculture, museums, and general service robotics. He

features regularly in public media, has published more than 100 peer-reviewed articles, and is actively engaged in promoting the public understanding of science through appearances in dedicated events, media appearances, and public lectures.

Robot customisation and Software Integration

SPRING speaker: Séverin Lemaignan, PAL Robotics

Venue: main auditorium

Time: 10:00 – 10:30

SPRING WP7 abstract: The latest advances achieved within SPRING's Work Package 7 (Robot customisation and software integration, led by PAL Robotics) will be presented. In particular: how was produced the necessary hardware and software technology to be able to develop, integrate and test all the SPRING modules. On the hardware side: provide a customized version of the SPRING-ARI robot that incorporates the appropriate and computing devices, and to manufacture and deploy this platform. On the software side: provide integration of the different software packages developed in the other work packages so that they are fully operative in the on-board computing resources of the robots.

PLENARY 02 - EXPERIMENTAL ROBOTICS: FROM RESULTS TO POLICIES (11:00-12:30)

AI and Children's Rights: Lessons Learnt from the Implementation of the UNICEF Policy Guidance to Social Robots for Children

Invited speaker: Vasiliki Charisi, European Commission, JRC Centre for Advanced Studies

Venue: main auditorium

Time: 11:00 – 12:00

Abstract: The rapid development of Artificial Intelligence (AI) places children in a constantly changing environment with new applications that utilize Generative AI, Social Robots and Virtual Reality impacting their online and offline lives. To ensure the development of responsible AI for children, UNICEF developed a Policy Guidance on AI and Children's Rights, drawing on inputs from international experts, governments, industry and children and invited organizations and industry to pilot their implementation in different kinds of applications. In this talk, I will describe the process of piloting some of the proposed recommendations in a social robot for children. The talk will tackle the following three aspects: A. How can recommendations and guidelines for AI and Children's Rights be embedded in industry strategies and translated into concrete technical specifications for AI products that protect children's privacy, safety, cyber-security, inclusion and non-discrimination and their rights in the digital world? B. How can we ensure children's inclusion in the whole cycle of product design, development, implementation, and evaluation? C. How can governments and

intergovernmental institutions support a transparent interaction between policy, industry, and civil society and ensure accountability?

Bio: Vicky Charisi is a Research Scientist at the European Commission, Joint Research Centre, Unit of Digital Transformation, Digital Economy and Society and at the EU Policy Lab. She studies the impact of Artificial Intelligence on Human Behaviour, and her research supports policymaking at the European Commission and internationally. She is particularly interested in understanding how interactive and intelligent systems, including social robots, affect human cognitive development, such as the processes of structure emergence especially in early childhood and how social interactions affect development. At the same time, she works on ethical considerations in the design and development of social robots and she has ongoing collaborations with UNICEF, United Nations ITU, IEEE Standards Association and other organizations for the consideration of human rights in the design of robots for children. In addition, her work tries to understand cross-cultural differences in the perception of fairness and she conducts studies in Europe, Africa and Asia. Vicky finished her Ph.D. studies at the UCL Institute of Education and worked at the University of Twente in the Human-Media Interaction group. Vicky has published more than 60 scientific publications and science-for-policy reports, and she serves as a Chair of the IEEE Computational Intelligence Society, Cognitive and Developmental Systems, TF of Human-Robot Interaction.

Experimental Validation of the SPRING-ARI robotic platform

SPRING speaker: Cyril Liotard, ERM Automatismes

Venue: main auditorium

Time: 12:00 – 12:30

SPRING WP1 abstract: The main objective of Work Package 1 (Experimental Validation, led by ERM) was to validate the developed robotic platform in a relevant environment, that is a day-care hospital (Broca), with particular focus on the success in achieving the use-case specific goals. This WP includes planning and managing for the necessary hardware and software tools to collect and manage data on-site, and prepare and execute appropriate experimental protocols to validate the developed technology.

PLENARY 03 - ETHICS-READY ROBOTICS OR ROBOT-READY ETHICS? (14:30-16:00)

Ethically Aligned Design for Social Robotics

Invited speaker: Raja Chatila, Sorbonne Université

Venue: main auditorium

Time: 14:30 – 15:00

Abstract: Social robots are designed to interact with humans. Humans are accostumed to interact with other humans of whom they have some understanding and of whom they expect some behavior, and with whom they share some common grounds and background knowledge. Humans also usually share common values among them, and have an undersrtand of the core values of other humans. Building robots that use human knowledge, have human shape and appearance, and interact in a human-like manner is usually justified by the objective of making the interaction more natural for humans. But at the same time this makes humans engage with a machine which actually doesn't have any understanding of the mentioned features about human-human interactions. It could at the most give an illusion thereof – which is in itself an ethical issue. Prior to any deployment of social robots with humans it is key to understand these factors and to design robots according to a methodology that enables some alignment with human values such as privacy, intimacy autonomy, dignity, etc., which have various concrete expressions depending on context. This ethically aligned design approach must be achieved prior to any technical design, throughout the design process itself, and robot deployment, considering robot users as welll all impacted stakeholders, including society itlsef. Their values must be analyzed, their tensions identified and design choices must then be evaluated and made on the basis of these analyses, then revised according to deployment evaluation.

Bio: Raja Chatila is Professor emeritus at Sorbonne Université. He is former Director of the Institute of Intelligent Systems and Robotics (ISIR) and of the Laboratory of Excellence "SMART" on human-machine interaction. He was director of LAAS-CNRS, Toulouse France, in 2007-2010. His research covers several aspects of Robotics in robot navigation and SLAM, motion planning and control, cognitive and control architectures, human-robot interaction, machine learning, and ethics. He works on robotics projects in the areas of service, field, aerial and space robotics. He is author of over 170 international publications on these topics. Current and recent projects: HumanE AI Net the network of excellence of AI centers in Europe, AI4EU promoting AI in Europe, AVETHICS on the ethics of automated vehicle decisions, Roboergosum on robot self-awareness and Spencer on human-robot interaction in populated environments. He was President of the IEEE Robotics and Automation Society for the term 2014-2015. He is co-chair of the Responsible AI Working group in the Global Partnership on AI (GPAI) and member of the French National Pilot Committee for Digital Ethics (CNPEN). He is chair of the IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems. He was member of the High Level Expert Group in AI with the European Commission (HLEG-AI). Honors: IEEE Fellow, IEEE Pioneer Award in Robotics and Automation, Honorary Doctor of Örebro University (Sweden).

Opportunities and challenges in putting AI ethics in practice: the role of the EU

Invited speaker: Mihalis Kritikos, Ethics and Integrity Sector of the European Commission (DG-RTD)

Venue: main auditorium

Time: 15:00 – 15:30

Abstract: The talk will shed light on the importance of establishing a distinct Ethics organizational/conceptual approach for research projects funded in the area of digital technologies, to enable the development of a human-centric, trustworthy and robust digital research ecosystem. To this end, for Horizon Europe, a first set of specialized guidance notes has been produced followed by several other organizational modalities. Given the novelty of this set of technologies from a research ethics governance perspective, the talk will discuss the particular needs for guidance, education, training and development of expertise. Furthermore, the challenges that are associated with the upcoming adoption of the EU Artificial Intelligence Act and its possible impact upon the design and implementation of research projects will be discussed. Particular attention will also be given to other EC initiatives in this field and to the work of other international organisations.

Bio: Mihalis Kritikos is a Policy Analyst at the Ethics and Integrity Sector of the European Commission (DG-RTD) working on the ethical development of emerging technologies with a special emphasis on AI Ethics and a Senior Associate Fellow at the Brussels School of Governance (Centre for Digitilisation, Democracy and Innovation). Before that, he worked at the Scientific Foresight Service of the European Parliament as a legal/ethics advisor on Science and Technology issues (STOA/EPRS) authoring more than 50 publications in the domain of new and emerging technologies and contributing to the drafting of more than 15 European Parliament reports/resolutions in the fields of artificial intelligence, robots, distributed ledger technologies and blockchains, precision farming, gene editing and disruptive innovation. He has worked as a Senior Associate in the EU Regulatory and Environment Affairs Department of White and Case, as a Lecturer at several UK Universities and as a Lecturer/Project Leader at the European Institute of Public Administration (EIPA).

Ethics and robot acceptance in a day-care hospital

SPRING speaker: Anne-Sophie Rigaud, APHP

Venue: main auditorium

Time: 15:30 – 16:00

SPRING WP10 abstract: Through Work Package 10 (led by APHP) we developed a set of guidelines to ensure compliance of all experiments and data collections with the relevant Privacy and Ethics regulations, thus allowing to put the SPRING-ARI robotic platform within the hospital premises. In addition, APHP leads the studies pertaining to the acceptance of the robotic platforms by patients, staff and accompanying persons. Advances on both of these aspects will be presented here.

PANEL SESSION: ARE SOCIAL ROBOTS ALREADY OUT THERE? IMMEDIATE CHALLENGES IN REAL-WORLD DEPLOYMENT (16:30-18:00)

Panellists: Vasiliki Charisi, Raja Chatila, Marc Hanheide, Severin Lemaignan, Cyril Liotard, Anne-Sophie Rigaud

Chair: Xavier Alameda-Pineda

Venue: main auditorium

Time: 16:30 – 18:00

Rationale: Challenges remain numerous for the deployment of actual social robots in our everyday lives (at work, at home) On the technical side, because robotic platforms are subject to certain hardware and software constraints. On the hardware side, because sensors and actuators are restricted in size, power and performance, since the physical space and the battery capacity are also limited. On the software side, because large models can be used if lots of computing resources are permanently available, which is not always the case, since they need to be shared between the various computing modules. Finally on the regulatory and legal side, because the rise of AI use is fast and needs to be balanced with ethical views that address our society's needs; but the construction of proper laws, norms and their acknowledgement and understanding by stakeholders is slow. In this session the panellists will survey all aspects of the problems at hand and provide you with an overview of the challenges that you as future scientists will need to solve in order to take social robots out of the labs and into the world!

PROGRAMME DETAILS: WED 21 FEB

PLENARY 04 - AUDIO-VISUAL PERCEPTION, THE ROBO-CENTRIC CASE (09:00-10:30)

Audio-Visual Speech Source Separation and Speaker Tracking

Invited speaker: Wenwu Wang, University of Surrey

Venue: main auditorium

Time: 09:00 – 10:00

Abstract: In complex room settings, machine listening systems may experience a decline in performance due to factors like room reverberations, background noise, and unwanted sounds. Concurrently, machine vision systems can suffer from issues like visual occlusions, insufficient lighting, and background clutter. Combining audio and visual data has the potential to overcome these limitations and enhance machine perception in complex audio-visual environments. In this talk, we will showcase selected works related to audio-visual

speech separation and speaker tracking. This encompasses the fusion of audio-visual data for speech source separation, employing techniques such as Gaussian mixture models, dictionary learning, and deep learning. In addition, we will explore the integration of audio-visual information for speaker tracking and localization, utilizing methods such as PHD filtering, particle flow, and deep learning. We will also provide insights into our ongoing advancements in this field, particularly in the context of ego-centric scenarios.

Bio: Wenwu Wang is a Professor in Signal Processing and Machine Learning, and a Co-Director of the Machine Audition Lab within the Centre for Vision Speech and Signal Processing, University of Surrey, UK. He is also an AI Fellow at the Surrey Institute for People Centred Artificial Intelligence. His current research interests include signal processing, machine learning and perception, artificial intelligence, machine audition (listening), and statistical anomaly detection. He has (co)-authored over 350 papers in these areas. He has been involved as Principal or Co-Investigator in more than 30 research projects, funded by UK and EU research councils, and industry (e.g. BBC, NPL, Samsung, Tencent, Huawei, Saab, Atlas, and Kaon). He is a (co-)recipient of over 15 awards including the IEEE Signal Processing Society 2022 Young Author Best Paper Award, ICAUS 2021 Best Paper Award, DCASE 2020 and 2023 Judge's Award, DCASE 2019 and 2020 Reproducible System Award, and LVA/ICA 2018 Best Student Paper Award. He is the elected Chair of IEEE Signal Processing Society (SPS) Machine Learning for Signal Processing Technical Committee, the Vice Chair of the EURASIP Technical Area Committee on Acoustic Speech and Music Signal Processing, a Board Member of IEEE SPS Technical Directions Board, an elected Member of the IEEE SPS Signal Processing Theory and Methods Technical Committee, and an elected Member of the International Steering Committee of Latent Variable Analysis and Signal Separation. He is an Associate Editor (2020-2025) for IEEE/ACM Transactions on Audio Speech and Language Processing. He was a Senior Area Editor (2019-2023) and an Associate Editor (2014-2018) for IEEE Transactions on Signal Processing.

Robust Audio-visual Perception of Humans

SPRING speaker: Sharon Gannot (TBC), BIU

Venue: main auditorium

Time: 10:00 – 10:30

SPRING WP3 abstract: This will present the latest advances in Work Package 3 (led by BIU) in ensuring the robust extraction, from the raw auditory and visual data, of users' low-level characteristics, namely position, speaking status and speech signal. It will oversee the Multi-Person Tracking module, jointly exploiting auditory and visual raw data to detect, localise and track multiple speakers; the Diarisation & Separation and the Speech Recognition modules, extracting the desired speaker(s) from a speech dynamic mixture and recognising the speech utterances from separated sources.

PLENARY 05 - MULTI-PARTY CONVERSATIONAL ROBOTS (11:00-12:30)

Predictive modelling of turn-taking in human-robot interaction

Invited speaker: Gabriel Skantze, KTH Stockholm

Venue: main auditorium

Time: 11:00 – 12:00

Abstract: Conversational interfaces, in the form of voice assistants, smart speakers, and social robots are becoming ubiquitous. This development is partly fueled by the recent developments in large language models. While this progress is very exciting, human-machine conversation is currently limited in many ways. In this talk, I will specifically address the modelling of conversational turn-taking. As current systems lack the sophisticated coordination mechanisms found in human-human interaction, they are often plagued by interruptions or sluggish responses. I will present our recent work on predictive modelling of turn-taking, which allows the system to not only react to turn-taking cues, but also predict upcoming turn-taking events and produce relevant cues to facilitate real-time coordination of spoken interaction.

Bio: Gabriel Skantze is a Professor in Speech Communication and Technology, with a specialization in Conversational Systems, at the Department of Speech Music and Hearing at KTH in Stockholm. His research studies human communication and computational models that allow computers and robots to have face-to-face conversations with humans. This involves both verbal and non-verbal (gaze, prosody, etc) aspects of communication, and his research involves phenomena such as turn-taking, feedback, joint attention, and language acquisition. Since social robots are likely to play an important role in our future society, the technology has direct applications, but it can also be used to increase our understanding of the mechanisms behind human communication. This requires an interdisciplinary approach, which includes language technology, artificial intelligence, machine learning, phonetics, and linguistics. In 2014, he co-founded the company Furhat Robotics (together with Samer Al Moubayed and Jonas Beskow at KTH) where he is working part-time as a Chief Scientist in the company. Gabriel is the President of SIGdial, the ACL (Association for Computational Linguistics) Special Interest Group on Discourse and Dialogue, Associate Editor for the Human-Robot Interaction section of Frontiers in Robotics and AI, and Action Editor for the ACL Rolling Review. He is an alumni member of the Young Academy of Sweden – an independent, cross-disciplinary forum for some of the most promising young researchers in Sweden in all disciplines.

Multi-User Spoken Conversations with Robots

SPRING speaker: Daniel Hernandez Garcia, HWU

Venue: main auditorium

Time: 12:00 – 12:30

SPRING WP5 abstract: Within this Work Package 5 (led by HWU) are developed techniques for multi-user conversation involving a robot and multiple humans as well as the overall robot task planning, with as particular outputs discussed here: a high-level task planner to connect the overall robot goal, with the low-level goals and the current status of the environment; and a multi-user conversational system trained on collected data.

POSTER SESSIONS 1 & 2 (14:30-16:00 & 16:30-18:00)

Venue: hallway

Time: 14:30-16:00 (session 1) & 16:30-18:00 (session 2)

Poster #01: The Social Bench Tool to study Child-Robot Interaction

Presenter: Francesca Cocchella, Italian Institute of Technology / University of Genoa

Abstract: As research on Child-Robot Interaction gains traction in the field of robotics, the need for tools to interpret this interaction becomes increasingly evident. When measuring children's impressions using conventional techniques, it's essential to consider their age, as their understanding and responses may vary. Consequently, obtaining uniform data can be challenging. To gain a deeper understanding of the results, it is advisable to combine different techniques, such as graphic representations of constructs (Severson & Lemm, 2016). In this context, we propose a tool designed to detect the relationship between children and robots and to comprehend the implicit attitudes towards them: the Social Bench Tool, adapted from the Social Exclusion Bench Tool developed by Mazzoni et al. (2021). Originally designed to study implicit prejudice, the Social Bench Tool involves presenting participants with an image of a bench on which a target is seated, and the participants are asked to choose where they would sit. In a pilot experiment involving the humanoid robot iCub (Metta et al., 2004), 44 young participants (12 female, 33 male, with a mean age of 17.3) visited our lab and interacted with the robot iCub, which introduced itself. They were asked to complete the Social Bench Tool both before and after their interaction with iCub and to respond to various perception measures related to the robot, designed to explicitly understand their attitudes towards the robot (NARS, UTAUT, IOS, humanoid appearance, and perceived role of the robot). Preliminary results suggest that the proximity of the position chosen by participants on the bench is positively associated with their positive perception of the robot in explicit measures and negatively associated with their negative perception of the robot. Ultimately, the Social Bench Tool can be a valuable addition to self-report scales, helping to provide a deeper understanding of the relationship between robots and children.

Poster #02: Large Language Models in Social Robots: The Key to Open Unconstrained Human-Robot Conversations?

Presenter: Maria Pinto, Ghent University

Abstract: Large Language Models (LLM), and especially the recent revolutions in LLMs with Reinforcement Learning from Human Feedback such as ChatGPT, can be integrated into social robots and have the potential to offer autonomous, fluent and open-ended spoken language interaction. This paper captures the technical and interaction challenges that we met and solved while integrating ChatGPT onto a humanoid platform. As LLMs are not built and trained for embodied interaction, more than a dozen technical obstacles must be overcome before arriving at a satisfactory spoken language human-robot interaction. We detail our efforts in solving aspects related to speech recognition, dialogue management, speech production, turn-taking, paralinguistic behaviour generation, context-awareness, long-term interaction, and episodic memory, and describe our development journey through in-house trials and co-design and prototype evaluation with 7 elderly users to build a robot that can serve as a companion to socially isolated elderly users.

Poster #03: Adaptive second language tutoring through generative AI and social robots

Presenter: Eva Verhelst, Ghent University

Abstract: Limited funding and too few teachers in classrooms make it impossible to provide students with extended one-on-one contact when learning a language. Due to the recent strong increase in the quality of large language models and related technology, we can propose a novel way for social robots to help alleviate these problems by acting as a second language tutor. We propose a system that provides real-time educational content using generative AI, allowing adaptation to the skills of the student while continuously providing new content. Social robots are especially suited for language education, as language learning is inherently social and the robot's embodiment allows for natural social interactions. Both the learning effect of the proposed game on the vocabulary acquisition and the influence of the robot's presence were tested during a user study with high school students. From this study, it was concluded that there was a significant learning effect, while the presence of the robot did not have a significant impact on the students' vocabulary acquisition. Further development of the proposed system shows great potential in providing second language practice when played with a social robot tutor, where novel content is continuously adapted to the needs of the student.

Poster #04: Design Space Model for Robots Supporting Trust of Children and Older Adults in Wellness Contexts

Presenter: Chia-Hsin Wu, Tampere University

Abstract: Robots have emerged as a form of assistive technology for physical and emotional wellness. Specifically, social robots can act as companions that actively support and motivate users by forming partnerships to achieve specific goals. Physical and emotional wellness are interconnected and contribute to the overall well-being of a person. The adaptive behaviors of companion robots have demonstrated promising potential in promoting physical-emotional wellness. However, social acceptance remains a key challenge in robotics implementation, particularly for vulnerable users who have limited knowledge of robotics and their integrated sensors. Perceived trustworthiness is one key component in determining the social acceptability of companion robots. To address this concern, this doctoral research aims to comprehend the aspect of life-long wellness by studying the trustworthiness of companion robots perceived by children and older adults. The research

adopts design science approach that employs both qualitative and quantitative methods for data collection and analysis. The research includes contributions from both technical and human-centered design perspectives. From the technical perspective, the research aims to identify suitable emotion recognition algorithms that interpret input signals from audio and visual modalities for companion robots to facilitate affective interaction, and to investigate whether the enhanced affective interaction can increase its trustworthiness perceived by children and older adults. From the human-centered design perspective, the objective is to produce an empirically founded design space model for conducting robotic design with children and older adults. The design space model aims to include (1) suggested interaction modalities and approaches, (2) a set of design implications, and (3) a measuring instrument, that emphasizes the trustworthiness and ethical considerations of companion robots in physical-emotional wellness contexts.

Poster #05: Goes to the Heart: Speaking the User's Native Language

Presenter: Shaul Ashkenazi, University of Glasgow

Abstract: We are developing a social robot to work alongside human support workers who help new arrivals in a country to navigate the necessary bureaucratic processes in that country. The ultimate goal is to develop a robot that can support refugees and asylum seekers in the UK. As a first step, we are targeting a less vulnerable population with similar support needs: international students in the University of Glasgow. As the target users are in a new country and may be in a state of stress when they seek support, forcing them to communicate in a foreign language will only fuel their anxiety, so a crucial aspect of the robot design is that it should speak the users' native language. Our social robot will be deployed in a public space, like others in recent years, where the technical challenges are significant, but the application areas and evaluations are much more realistic [1, 2]. We provide a technical description of the Furhat robot [3] hardware and software, and describe the user study that will shortly be carried out. At the end, we explain how we are engaging with refugee support organisations to extend the robot into one that can also support refugees and asylum seekers.

References:
[1] Omar Mubin, Muneeb Imtiaz Ahmad, Simranjit Kaur, Wen Shi, and Aila Khan. 2018. Social robots in public spaces: A meta-review. In Social Robotics: 10th International Conference, ICSR 2018, Qingdao, China, November 28-30, 2018, Proceedings 10. Springer, 213–220. [2] Sebastian Schneider, Werner Clas, and Dražen Brščić. 2022. Human-Robot Interaction in Public Spaces. In 2022 17th ACM/IEEE International Conference on Human-Robot Interaction (HRI). IEEE, 1287–1289. [3] Samer Al Moubayed, Jonas Beskow, Gabriel Skantze, and Björn Granström. 2012. Furhat: a back-projected human-like robot head for multiparty human-machine interaction. In Cognitive Behavioural Systems: COST 2102 International Training School, Dresden, Germany, February 21-26, 2011, Revised Selected Papers. Springer, 114–130.

Poster #06: Co-designing Conversational Agents for the Elderly: A Comprehensive Review

Presenter: Sidonie Salomé, Université Grenoble Alpes

Abstract: Background: The growth of the aging population has significant implications for society, highlighting the increasing importance of caring for the elderly. While many individuals express a desire to age at home, aging is associated with domestic risks. New technologies, particularly conversational agents, can represent a promising solution to mitigate domestic risks. However, integrating technology in this context is not without risks for the elderly, as it may not adequately meet their real needs and presents ethical concerns. A potential solution lies in adopting co-design methods specifically tailored to the elderly. Currently, there is no consensus on the effectiveness indicators of these methods. Research design and methods: We conducted a systematic review to (a) examine which co-design methods for conversational agents are used for the elderly (≥60 years), (b) identify specific characteristics of these methods, and (c) identify obstacles and facilitators in the co-design process with the elderly. Research was conducted on Google Scholar, Pubmed, MEDLINE, Web of Science, Scihub, DBLP, and IEEE. Results: We identified 8,807 articles and included 19 projects. Few projects reported modifications to tools and methods due to age. Co-design processes varied significantly in their level of involvement of the elderly. Discussion and implications: The impact of co-designed technology on domestic risks has been rarely analyzed, making it challenging to determine its influence. Future co-design initiatives should specifically address challenges inherent to the elderly. It is imperative to evaluate the impact of co-designed technologies.

Poster #07: Improvement of real-world dialogue recognition and capabilities of social robots

Presenter: Andrew Blair, University of Glasgow

Abstract: Social robots have begun to be placed into the wild for some time now. However, almost all of these decline to use dialogue as a method of interacting with the robot. Commercial solutions such as the Plato robot for restaurants, or Emirates new check in robot are examples of this. This is unexpected at first – within lab settings this is explored thoroughly. However, it becomes apparent quickly that ASR has a very high failure rate within public environments [2]. A workshop around wider struggles in HRI conversation [1] discusses it briefly; however, within public spaces, the effectiveness of any solution hinges on audibility. Without clear communication, resolving other aspects becomes irrelevant. We propose an approach to solve this by using a combination of novel hardware and software techniques. The use of highly directional microphones, combined with analogue rather than digital processing, will allow the signal with the lowest SNR ratio achievable to reach the digital component of our system. By using analogue electronics approaches, we propose a lightweight solution that can run with minimal processing power and as such help to provide a close to real time automatic speech recognition. We also propose running the eventual ASR transformer locally, aiding with both speed and privacy. A fully functioning dialogue system gives the opportunity to mirror a human conversation closely and as such will allow dialogue comparisons between human-human communication and human-robot communication.

References:

[1] F. Förster et al., 'Working with Troubles and Failures in Conversation Between Humans and Robots', in Proceedings of the 5th International Conference on Conversational User Interfaces. [2] Irfan, B., Hellou, M., Mazel, A., & Belpaeme, T. (2020, March). Challenges of a real-world hri study with non-native english speakers: Can personalisation save the day?. In

Companion of the 2020 ACM//IEEE International Conference on Human-Robot Interaction (pp. 272-274).

Poster #08: I Was Blind but Now I See: Implementing Vision-Enabled Dialogue in Social Robots

Presenter: Giulio Antonio Abbo, Ghent University

Abstract: In the rapidly evolving landscape of human-computer interaction, the integration of vision capabilities into conversational agents stands as a crucial advancement. This paper presents an initial implementation of a dialogue manager that leverages the latest progress in Large Language Models (e.g., GPT-4, IDEFICS) to enhance the traditional text-based prompts with real-time visual input. LLMs are used to interpret both textual prompts and visual stimuli, creating a more contextually aware conversational agent. The system's prompt engineering, incorporating dialogue with summarisation of the images, ensures a balance between context preservation and computational efficiency. Six interactions with a Furhat robot powered by this system are reported, illustrating and discussing the results obtained. By implementing this vision-enabled dialogue system, the paper envisions a future where conversational agents seamlessly blend textual and visual modalities, enabling richer, more context-aware dialogues.

Poster #09: Sound Source Localization and Tracking in Complex Acoustic Scenes

Presenter: Taous Iatariene, Université de Lorraine

Abstract: Tracking in the context of sound scene analysis consists in estimating the trajectories of the sound sources present in multichannel recordings of an acoustic scene. It is often a prerequisite for many audio applications like sound source separation, where some of the existing techniques require the knowledge of the position of the sources present in the scene at each time [1]. Typically, a tracker comes after a localizer, which provides position estimations (or detections) for the tracker to reconstruct trajectories. While in easy scenario cases, classical tracking methods reach good performance, it decreases in complex acoustic scenes, like indoor scenes which can be highly reverberant, and/or scenes containing moving and intermittent sources. This is due to the lower quality of the localizer's detections in those scenarios. Since the tracking performance depends highly on the localizer performance, we propose an in-depth study of the localization system. Building on previous works [2], we chose a neural network-based localizer, and made a statistical metric evaluation on many variants of the model to choose the most reliable localizer in complex scenarios. We linked a baseline tracker [3] to the chosen localizer to output realistic but improvable trajectories. Finally, we propose an overview of sound source tracking metrics, inspired from the multi-object tracking research community [4] and the LOCATA Challenge [5].

References: [1] S. Gannot, E. Vincent, S. Markovich-Golan and A. Ozerov, "A Consolidated Perspective on Multimicrophone Speech Enhancement and Source Separation," in IEEE/ACM Transactions on Audio, Speech, and Language Processing, vol. 25, no. 4, pp. 692-730, April 2017, doi: 10.1109/TASLP.2016.2647702. [2] P. -A. Grumiaux, S. Kitić, L. Girin and A. Guérin, "Improved feature extraction for CRNN-based multiple sound source localization," 2021 29th European Signal Processing Conference (EUSIPCO), Dublin, Ireland, 2021, pp. 231-235, doi: 10.23919/EUSIPCO54536.2021.9616124. [3] Kitić, S., & Guérin, A. (2018). TRAMP: Tracking

by a Real-time AMbisonic-based Particle filter. arXiv preprint arXiv:1810.04080. [4] Luiten, J., Os̆ep, A., Dendorfer, P. et al. HOTA: A Higher Order Metric for Evaluating Multi-object Tracking. Int J Comput Vis 129, 548–578 (2021). https://doi.org/10.1007/s11263-020-01375-2 [5] Evers, C., Löllmann, H. W., Mellmann, H., Schmidt, A., Barfuss, H., Naylor, P. A., & Kellermann, W. (2020). The LOCATA challenge: Acoustic source localization and tracking. IEEE/ACM Transactions on Audio, Speech, and Language Processing, 28, 1620-1643.

Poster #10: A probabilistic approach for learning and adapting shared control skills with the human in the loop

Presenter: Gabriel Quere, German Aerospace Center (DLR) - U2IS, IP Paris

Abstract: Assistive robots promise to be of great help to wheelchair users with motor impairments, for example for activities of daily living. Using shared control to provide taskspecific assistance – for instance with the Shared Control Templates (SCT) framework – facilitates user control, even with low-dimensional input signals. However, designing SCTs is a laborious task requiring robotic expertise. To facilitate their design, we propose a method to learn one of their core components – active constraints – from demonstrated endeffector trajectories. We use a probabilistic model, Kernelized Movement Primitives, which additionally allows adaptation from user commands to improve the shared control skills, during both design and execution. We demonstrate that the SCTs so acquired can be successfully used to pick up an object, as well as adjusted for new environmental constraints, with our assistive robot EDAN.

Poster #11: Musical Robot for People with Dementia

Presenter: Paul Raingeard de la Bletiere, TU Delft

Abstract: This research focuses on creating a Musical Robot for People with Dementia. In practice, this work aims to personalize therapeutic interventions (mainly music therapy and reminiscence therapy) while exploring the role of Human-Robot Interactions in cognition and mood improvements. We also look at how music and episodic memories can be linked to form new kinds of therapy. This research is part of the QoLEAD project which aims at bridging the gap between care and AI for People with Dementia.

Poster #12: Univariate Radial Basis Function Layers: Brain-inspired Deep Neural Layers for Low-Dimensional Inputs

Presenter: Daniel Jost, INRIA @ UGA

Abstract: Deep Neural Networks (DNNs) became the standard tool for function approximation with most of the introduced architectures being developed for high-dimensional input data. However, many real-world problems have low-dimensional inputs for which standard Multi-Layer Perceptrons (MLPs) are the default choice. An investigation into specialized architectures is missing. We propose a novel DNN layer called Univariate Radial Basis Function (U-RBF) layer as an alternative. Similar to sensory neurons in the brain, the U-RBF layer processes each individual input dimension with a population of neurons whose activations depend on different preferred input values. We verify its effectiveness compared to MLPs in low-dimensional function regressions and reinforcement learning tasks. The

results show that the U-RBF is especially advantageous when the target function becomes complex and difficult to approximate.

Poster #13: Mixture of Dynamical Variational Autoencoders for Multi-Source Trajectory Modeling and Separation

Presenter: Xiaoyu Lin, INRIA @ UGA

Abstract: In this paper, we propose a latent-variable generative model called mixture of dynamical variational autoencoders (MixDVAE) to model the dynamics of a system composed of multiple moving sources. A DVAE model is pre-trained on a single-source dataset to capture the source dynamics. Then, multiple instances of the pre-trained DVAE model are integrated into a multi-source mixture model with a discrete observation-to-source assignment latent variable. The posterior distributions of both the discrete observation-to-source assignment variable and the continuous DVAE variables representing the sources content/position are estimated using a variational expectation-maximization algorithm, leading to multi-source trajectories estimation. We illustrate the versatility of the proposed MixDVAE model on two tasks: a computer vision task, namely multi-object tracking, and an audio processing task, namely single-channel audio source separation. Experimental results show that the proposed method works well on these two tasks, and outperforms several baseline methods.

Poster #14: Preference-Based Reinforcement Learning for Social Robotics

Presenter: Anand Ballou, INRIA @ UGA

Abstract: Deep Reinforcement Learning (DRL) has achieved impressive results in diverse domains, but struggles with social robotics tasks like navigation, where crafting suitable reward functions is challenging. Current solutions like imitation learning have limitations. Imitation learning demands extensive data, impractical in robotics. Likewise, sparse rewards offer weak learning signals, requiring refined exploration strategies. Preference-based learning methods offers an alternative, eliminating the need of explicit reward functions definition by leveraging human feedback to learn a reward model. While efficient, it necessitates continuous and consequent human intervention during policy training, often infeasible in practice. Moreover existing methods are vulnerable to missing or poorly defined reward features. To overcome these limitations, we propose a two-stage approach: (1) pre-train a policy with diverse reward functions, and (2) use human preference pairs to pick the policy parameters aligning with the desired behavior. This significantly reduces required human feedback compared to continuous interaction in preference-based learning. Our key innovation lies in incorporating meta-reinforcement learning techniques. This enables the policy to adapt to different environments and handle missing features, leading to better robustness. We conducted extensive experiments in three social robotics environments, evaluating final reward, feedback needed, and training time. Results demonstrate our meta-learning-based approach is more robust to missing reward features.

Poster #15: Speech Modeling with a Hierarchical Transformer Dynamical VAE

Presenter: Xiaoyu Lin, INRIA @ UGA

Abstract: an yThe dynamical variational autoencoders (DVAEs) are a family of latent-variable deep generative models that extends the VAE to model a sequence of observed data and a corresponding sequence of latent vectors. In almost all the DVAEs of the literature, the temporal dependencies within each sequence and across the two sequences are modeled with recurrent neural networks. In this paper, we propose to model speech signals with the Hierarchical Transformer DVAE (HiT-DVAE), which is a DVAE with two levels of latent variable (sequence-wise and frame-wise) and in which the temporal dependencies are implemented with the Transformer architecture. We show that HiT-DVAE outperforms several other DVAEs for speech spectrogram modeling, while enabling a simpler training procedure, revealing its high potential for downstream low-level speech processing tasks such as speech enhancement.

PROGRAMME DETAILS: THU 22 FEB

PLENARY 06 - SOCIAL ROBOT BEHAVIOR POLICIES (09:00-10:30)

Human-Interactive Mobile Robots: from Learning to Deployment

Invited speaker: Xuesu Xiao, George Mason University

Venue: main auditorium

Time: 09:00 – 10:00

Abstract: During the transition from highly restricted workspaces such as factories and warehouses into complex and unstructured populated environments, mobile robots encounter both challenges and opportunities: On one hand, human-robot interactions in the wild are diverse and uncertain, necessitating mobile robots to reason about and act upon unwritten social norms; On the other hand, the variety of humans in the wild also provides a wealth of knowledge that robots can harness to enhance their adaptivity. In this winter school course, we will discuss methodologies for developing human-interactive mobile robots that efficiently learn from and harmoniously deploy among humans, with a focus on trustworthy and explainable real-world navigation systems: (1) To learn from (non-expert) humans, Adaptive Planner Parameter Learning (APPL) leverages simple human interaction modalities and fine-tunes existing motion planners; (2) To deploy in human-populated social spaces, two large-scale datasets, Socially Compliant Navigation Dataset (SCAND) and Multimodal Social Human Navigation Dataset (MuSoHu), allow mobile robots to learn social navigation using, e.g., inverse optimal control and a hybrid classical and learning-based paradigm.

Bio: Xuesu Xiao is an Assistant Professor in the Department of Computer Science at George Mason University. Xuesu (Prof. XX) directs the RobotiXX lab, in which researchers (XX-Men) and robots (XX-Bots) work together at the intersection of motion planning and machine learning with a specific focus on developing highly capable and intelligent mobile robots that are robustly deployable in the real world with minimal human supervision. Xuesu received his Ph.D. in Computer Science from Texas A&M University in 2019, Master of Science in Mechanical Engineering from Carnegie Mellon University in 2015, and dual Bachelor of Engineering in Mechatronics Engineering from Tongji University and FH Aachen University of Applied Sciences in 2013. His research has been featured by Google AI Blog, IEEE Spectrum, US Army, Robotics Business Review, Tech Briefs, and WIRED. He serves as an Associate Editor for IEEE Robotics and Automation Letters, International Conference on Robotics and Automation, International Conference on Intelligent Robots and Systems, and International Symposium on Safety, Security, and Rescue Robotics.

Learning Robot Behaviour

SPRING speaker: Chris Reinke, INRIA

Venue: main auditorium

Time: 10:00 – 10:30

SPRING WP6 abstract: This will present the latest advances in Work Package 6 (led by INRIA) in developing and implementing methodologies enabling the robot to automatically learn action policies do decide (i) how to explore the environment, (ii) how to move towards one or several persons in order to improve the quality of the sensory data (images and acoustic signals), (iii) how to attract the attention of the selected persons in order to facilitate face-to-face communication, and (iv) action policies for multi-party conversation management.

PLENARY 07 - SENSING THE ENVIRONMENT: FROM DETECTING FALLS TO ROBOT SELF-LOCALISATION (11:00-12:30)

Human-presence modeling and social navigation of an assistive robot solution for detection of falls and elderly's support

Invited speaker: Antonios Gasteratos, Democritus University of Thrace

Venue: main auditorium

Time: 11:00 – 12:00

Abstract: As the world's population ages, there is an increasing demand for intelligent systems that can facilitate individuals' independence while ensuring their safety. Assistive robotics has emerged as a viable tool in this context, providing personalized help and autonomy. We present the design and implementation of an assisted living robot tailored to the fall detection challenge. By leveraging robust SLAM, human-aware navigation and fall detection algorithms, we aim to present a safe and effective, real-time and comprehensive robotic strategy to detect and act in fall detection events. A developed robotic platform is demonstrated and assessed in practical assisted living scenarios. Finally, contemporary research methodologies, potential ideas and challenges of social aware robot navigation are discussed.

Bio: Antonios Gasteratos (FIET) is a Full Professor of Robotics, Mechatronics and Computer Vision at Democritus University of Thrace, Dean of the School of Engineering and Director of the Laboratory of Robotics and Automation. He holds a MEng. and a PhD in Electrical and Computer Engineering, Democritus University of Thrace (1994 and 1999, respectively). During the past 20 years he has been principal investigator to several projects funded mostly by the European Commission, the European Space Agency, the Greek Secretariat for Research and Technology, Industry and other sources, which were mostly related to robotics and vision. He has published over 300 papers in peer reviewed journals and international conferences and written 4 textbooks in Greek. He is Subject Editor-in-Chief in Electronics Letters and Assoc. Editor at the Expert Systems with Applications, International Journal of Optomechatronics, International Journal of Advanced Robotics Systems. He is also evaluator of projects supported by the European Commission and other funding agencies, as well as reviewer in many international journals in the field of Computer Vision and Robotics. Antonios Gasteratos has been a member of programme committees of international conferences and chairman and co-chairman of international conferences and workshops.

Environment Mapping, Self-localisation and Simulation

SPRING speaker: Michal Polic, CVUT

Venue: main auditorium

Time: 12:00 – 12:30

SPRING WP2 abstract: Within Work Package 2 (led by CVUT) are developed models, representations and learning algorithms for building and updating a map from the environment, and simulating audio-visual data according to the semantic and behavioural patterns of it. Here we will present the Visual Robot Localisation module, that performs robot self-localisation from vision, a Visual Semantics module, that achieves language-driven robot self-localisation ; and the Online Map Update module, aiming to update the current map of the environment with behavioural and semantic information.

SOCIAL PROGRAMME / FREE TIME (14:00 – 18:00)

The SoRAIM school proposes in the afternoon of Thursday 22 February a double visit of the old town of Grenoble with a professional guide (in English only). Beware: only 30 slots available for each so register asap!

Alternatively, you are also free to explore on your own.

Visit #1: Historic Grenoble

Registration form (30 slots only available!)

Time: 14:00 – 15:30

Start venue: Grenoble's Tourism Office

Contents: This walk through the old town takes you on a journey through Grenoble's Grenoble's fabulous history, which goes back over 2,000 years. A city where knight Bayard, the Duc de Lesdiguières, Aristide Bergès and Marie Reynoard lived. Historic monuments and ancient residences such as the former such as the former Palais du Parlement, the cathedral and Stendhal's house. The 1st group tour ends at 15:30.

Visit #2: Climb to Bastille & Alps Panorama

Registration form (30 slots only available!):

Time: 15:30 – 17:00

Start venue: Grenoble-Bastille cable car (bottom station)

Contents: Try the Bastille climb using the famous "bubbles" of the cable car built in 1934 and symbol of the city. In just a few minutes, you'll reach the fortified site of the Bastille, in the foothills of the Chartreuse massif. Enjoy the unforgettable view over the town and its mountainous surroundings, which stretch from the Chartreuse massif, to Belledonne and Vercors, all the way to Mont Blanc! The 2nd group tour ends at 5pm on the Bastille site.

PROGRAMME DETAILS: FRI 23 FEB

PLENARY 08 - UNDERSTANDING HUMAN BEHAVIOR FOR MENTAL WELLBEING ROBOTIC COACHES (09:00-10:30)

Robotic Coaches for Mental Wellbeing: From the Lab to the Real World

Invited speaker: Hatice Gunes, University of Cambridge

Venue: main auditorium

Time: 09:00 – 10:00

Abstract: In recent years, the field of socially assistive robotics for promoting wellbeing has witnessed a notable surge in research activity. It is increasingly recognized within the realms of social robotics and human-robot interaction (HRI) that robots have the potential to function as valuable instruments for evaluating, sustaining, and enhancing various aspects of human wellbeing, including physical, mental, and emotional health. At the Cambridge Affective Intelligence and Robotics Lab (https://cambridge-afar.github.io/), our work on creating robotic coaches for mental wellbeing started in 2019 with a 5-year funding from the UK Engineering and Physical Sciences Research Council (EPSRC). Since then, we have engaged in a series of studies, employing an iterative approach that integrates user-centric design, testing, and deployment in both controlled laboratory settings and real-world contexts, while learning from failure and mistakes and striving to continuously improve our robotic coaches. We have done this by 1) collaborating with experienced human coaches and professionals who currently deliver these interventions, 2) gaining insights into the expectations and perceptions of potential users, and collecting valuable feedback from them, and 3) developing real-time AI and data-driven affective adaptation mechanisms for longitudinal deployment. In this talk, I will share our journey in developing robotic coaches for mental wellbeing and transitioning them from the controlled lab environment to real-world settings, and will illustrate the challenges and opportunities of social robotics for promoting wellbeing with a number of case studies, with insights for short- and long-term adaptation, and highlight the perceptions and expectations of prospective users to guide future research in this area.

Bio: Hatice Gunes is a Professor of Affective Intelligence and Robotics (AFAR) and the Director of the AFAR Lab at the University of Cambridge's Department of Computer Science and Technology. Her expertise is in the areas of affective computing and social signal processing cross-fertilising research in multimodal interaction, computer vision, machine learning, social robotics and human-robot interaction. She has published over 165 papers in these areas (H-index=37, citations > 7,700), with most recent works on bias mitigation and fairness for affective computing, multiple appropriate facial reaction

generation, graph representation for personality recognition, lifelong and continual learning for facial expression recognition and affective robotics, and longitudinal HRI for wellbeing. She has served as an Associate Editor for IEEE Transactions on Affective Computing, IEEE Transactions on Multimedia, and Image and Vision Computing Journal, and has guest edited many Special Issues, the latest ones being 2022-23 Int'l Journal of Social Robotics Special Issue on Embodied Agents for Wellbeing, 2021-22 Frontiers in Robotics and AI Special Issue on Lifelong Learning and Long-Term Human-Robot Interaction, and 2020-21 IEEE Transactions on Affective Computing Special Issue on Automated Perception of Human Affect from Longitudinal Behavioural Data. Other research highlights include Outstanding PC Award at ACM/IEEE HRI'23, RSJ/KROS Distinguished Interdisciplinary Research Award Finalist at IEEE RO-MAN'21, Distinguished PC Award at IJCAI'21, Best Paper Award Finalist at IEEE RO-MAN'20, Finalist for the 2018 Frontiers Spotlight Award, Outstanding Paper Award at IEEE FG'11, and Best Demo Award at IEEE ACII'09. Prof Gunes is the former President of the Association for the Advancement of Affective Computing (2017-2019), is/was the General Co-Chair of ACM ICMI'24 and ACII'19, and the Program Co-Chair of ACM/IEEE HRI'20 and IEEE FG'17. She was the Chair of the Steering Board of IEEE Transactions on Affective Computing (2017-2019) and was a member of the Human-Robot Interaction Steering Committee (2018-2021. Her research has been supported by various competitive grants, with funding from Google, the Engineering and Physical Sciences Research Council UK (EPSRC), Innovate UK, British Council, Alan Turing Institute and EU Horizon 2020. In 2019 she was awarded a prestigious EPSRC Fellowship to investigate adaptive robotic emotional intelligence for wellbeing (2019-2025) and has been named a Faculty Fellow of the Alan Turing Institute – UK's national centre for data science and artificial intelligence (2019-2021). Prof Gunes is a Staff Fellow of Trinity Hall, a Senior Member of the IEEE, and a member of the AAAC.

Multi-Modal Human Behaviour Understanding

SPRING speaker: Lorenzo Vaquero Otal, UNITN

Venue: main auditorium

Time: 10:00 – 10:30

SPRING WP4 abstract: This will present the latest advances in Work Package 4 (led by UNITN) in developing models and algorithms to recognise and interpret high-level human behaviours. More specifically, it will focus on three software modules enabling the robot to understand human behaviour: Describing Humans, Behaviour Recognition and Affect Analysis.

HANDS-ON SESSIONS (11:00-12:30 & 14:30-16:00)

On Friday morning and afternoon will take place, in parallel, five different hands-on sessions. These consist in:

- a navigation simulation (lead: INRIA);

- a use case of the people identifier/manager (lead: PAL Robotics -- online);
- a prompt engineering building conversational system with LLM (lead: HWU);
- a localisation trial (lead: CVUT);
- a speaker extraction use case (lead: BIU).

Further details of the programme of these hands-on sessions will be given later, as well as directions to packages to be downloaded/installed on your computer prior to the sessions.

You need to register for these sessions. There are 10 seats maximum per hands-on session and we plan two sessions; you can therefore register for a maximum of two sessions.

Registration form for the Hands-on sessions