Emmanuel Senft

Curriculum Vitae, 02/2024

Idiap Research Institute, 1920, Martigny, CH
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EMPLOYMENT

Sep. 2022 – current **Research Scientist**, *Group Leader: Human-centered Robotics and AI, Idiap Research Institute, Martigny*, Switzerland.

Oct. 2019 – Aug. 2022 **Research Associate**, *People and Robots Lab, University of Wisconsin–Madison*, USA.
Advisors: Prof. Bilge Mutlu and Prof. Michael Gleicher

Jun. 2019 – Aug. 2019 **Cooperate Researcher**, *JSPS Summer program, IRC - ATR*, Japan.
Advisor: Prof. Takayuki Kanda

Jan. 2019 – Mar. 2019 **Research Fellow (part-time)**, *University of Plymouth*, UK.
Advisor: Prof. Tony Belpaeme

Jan. 2018 – Dec. 2018 **Research Assistant**, *University of Plymouth*, UK.
Advisor: Prof. Tony Belpaeme

EDUCATION

Oct. 2014 – Oct. 2018 **PhD**, *University of Plymouth*, UK, *Teaching Robots Social Autonomy From In Situ Human Supervision*, *Viva Voce:* 23.10.2018.
Supervisory team: Prof. Tony Belpaeme, Prof. Paul Baxter, and Dr. Séverin Lemaignan.

Sep. 2011 – Aug.2013 **Master of Science in Microengineering**, *EPFL (École Polytechnique Fédérale de Lausanne)*, Switzerland, with Minor in Area and Cultural Studies.
Master thesis advisor: Prof. Auke J. Ijspeert.

Sep. 2008 – Aug. 2011 **Bachelor of Science in Microengineering**, *EPFL (École Polytechnique Fédérale de Lausanne)*, Switzerland.

STUDENT CO-SUPERVISION

Idiap/EPFL **PhD Student**, Shalutha Rajapakshe.
Master Students (Semester projects), Rhea Saber, Chun-Tzu Chang.
Intern Students, Atharva Dastenavar, Aliyasin El Ayouch.

UW–Madison **PhD Student**, Michael Hagenow, Laura Stegner, Pragathi Praveena, and Anna Konstant.
Master Student, Kevin Welsh and Prajna Bhat.
Undergraduate Student, Titus Smith and Yash Hindka.

AWARD & FUNDING

2024 Swiss Young Academy joint project: *AI in Science and Society* (4'219 CHF).

2023 Elected member of the Swiss Young Academy.
Innosuisse: *Predictive Manufacturing, Predictive Maintenance* (206'569.45 CHF).
Innocheque: *LioGPT* (15'000 CHF).
Network Institute (VU Amsterdam): Research Visit (6'000 €).
Loterie Romande: CollabCloud project (100'000 out of 280'000 CHF).
ACM/IEEE HRI conference **Outstanding program committee member**.

2019 **Queen Mary UK Best PhD in Robotics Award**: Second position.
JSPS Summer Fellowship for the project *Socially-Appropriate Behaviour for an Omni-based Social Robot in Narrow Environment*, with Prof. Takayuki Kanda at ATR, Japan.

TEACHING ACTIVITIES

Practical ROCO 318 - Mobile and Humanoid Robots at the University of Plymouth, *Demonstrator* (2015–2017). I organized practical works to allow students to explore walking with real biped robots, with robots developed at the university and the Nao robot.

SCIENTIFIC REVIEWING ACTIVITIES

EDITORIAL WORK

ACM Transactions on Human-Robot Interaction, *Guest Editor*
Frontiers in Robotics and AI, *Guest Editor*
IROS 2024, *Associate Editor*
HRI 2022, 2023, *PC Member*
HAI 2023, *PC Member*
AAMAS 2019, *PC Member*

REFEREE SERVICE

Journals

Scientific Reports
Frontiers in Robotics and AI
Robotics and Automation Letters
Journal of Human-Robot Interaction
IEEE Transactions in Human-Robot Interaction
International Journal of Social Robotics
Mechatronics
European Heart Journal
Intelligent Service Robotics
Interaction Studies
Behaviour and Interaction Technology
International Journal of Human–Computer Interaction

Conferences

ACM/IEEE Human-Robot Interaction Conference (HRI)
Robotics: Science and Systems Conference (RSS)
IEEE International Conference on Robotics and Automation (ICRA)
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
ACM SIGCHI Conference on Computer-Supported Cooperative Work & Social Computing (CSCW)
IEEE-RAS Conference on Humanoid Robots
International Conference on Social Robotics (ICSR)
IEEE International Conference on Development and Learning and Epigenetic Robotics (ICDL-EpiRob)
International Conference on Human-Agent Interaction (HAI)
Towards Autonomous Robotic Systems Conference (TAROS)
IEEE International Symposium on Robot-Human Interactive Communication (Ro-Man)

EVENT ORGANIZATION

HRI 2025 *Late-Breaking Report Co-Chair*
TAHRI 2023 *Program Chair*
Wisconsin Robotics Seminar Series (2020-2022), *Organizer*
HRI Workshop (2024) - 3rd Workshop on Human-Interactive Robot Learning, *Organizer*
HRI Workshop (2023) - Test Methods and Metrics for Accessible HRI, *Organizer*
HRI Workshop (2022)- Participatory Design and End-User Programming for HRI, *Organizer*
HRI Workshop (2019) - Robots in Therapy and Care, *Organizer*
AAAI Symposium - AI-HRI (2017-current), *Co-Chair / Program Chair / Organizer*

INVITED TALKS and PRESENTATIONS

2023 **AI Seminar** - **HEPIA** (Geneva, Switzerland)

Centre Universitaire de Traitement et Réadaptation - CHUV (Lausanne, Switzerland)
Rehazentrum Valens (Valens, Switzerland)
Geriatronics Summit 2023 - MIRMI (Garmisch-Partenkirchen, Germany)
EPFL Pavillion (EPFL, Switzerland)
F&P Robotics Seminar (online)
Network Institute - VU Amsterdam (Amsterdam, Netherlands)
Robotics Seminar - Cornell University (Ithaca, NY, USA)
Assistive Agent Behavior and Learning Lab - Tufts (Boston, MA, USA)

2022 **HRI Laboratory - Kyoto University** (Kyoto, Japan)
HRI Class - Colorado School of Mines (online)
Naver Labs (Grenoble, France)

2021 **NASA Transformative Aeronautics Concepts Program (TACP) Showcase** (online)
IROHMS - Cardiff (online)

2020 **HRI Lab - University of Chicago** (online)

2019 **CHILI Lab - EPFL** (Lausanne, Switzerland)
Robot Learning and Interaction Lab - Idiap (Martigny, Switzerland)

PRESS COVERAGE

2020 **Financial Times.** Opinion sought for *"How AI eases teachers' heavy workloads"*.

Teacher Magazine. Interview for and research covered in *"Using robots to assist teachers and improve student learning"*.

2019 **Financial Times.** Interview for and research covered in *"Robot trained to be useful teaching assistant in three hours"*.

The Telegraph. Research covered in *"British schools test 'robot teachers' to tackle staff shortage"*.

COLLABORATIONS

Swiss Academies
Election in May 2023 to the Swiss Young Academy to carry out inter- and transdisciplinary projects and activities at the many intersections of science and society.

IEEE Standards Association
Member of the standardization efforts IEEE P3107 (Standard Terminology for Human-Robot Interaction) and P3108 (Recommended Practice for Human-Robot Interaction Design of Human Subject Studies).

Education
Local schools (Plymouth, UK). Developing and evaluating robot tutoring solutions.

Healthcare
Therapists (Babeș-Bolyai University, Roumania), industry (Softbank Robotics EU) and academics in EU FP7 project. Developing therapy-driven robotic technologies for children with ASD.

Clinicians and hospital staff (Fundacion Cardioinfantil, Bogota, Colombia) and academics. Socially assistive robots for cardiac rehabilitation.

Manufacturing
The Boeing Company, NASA, and academics in a NASA ULI project. Designing robot platforms for collaborative aircraft manufacturing.

Television
Channel 4 (UK). Designing a teleoperation interface for the Pepper robot for the show: The Secret Life of 4 and 5 Year Olds.

Museums
Fondation Pierre Gianadda: deployment of the Pepper robot to present a quizz to visitors.

PUBLICATIONS

Journals

2023 **Periscope: A Robotic Camera System to Support Remote Physical Collaboration.**
P. Praveena, Y. Wang, **E. Senft**, M. Gleicher, B. Mutlu
Proceedings of the ACM on Human-Computer Interaction Volume 7 Issue CSCW2.

Coordinated Multi-Robot Shared Autonomy Based on Scheduling and Demonstrations.
M. Hagenow, **E. Senft**, N. Orr, R. Radwin, M. Gleicher, B. Mutlu, D. P. Losey, M. Zinn
IEEE Robotics and Automation Letters.

2022 **Personalised Socially Assistive Robot for Cardiac Rehabilitation: Critical Reflections on Long-Term Interactions in the Real World.**
B. Irfan, N. Céspedes, J. Casas, **E. Senft**, L.F. Gutiérrez, M. Rincon-Roncancio, C.A. Cifuentes, T. Belpaeme, and M. Múnera
User Modeling and User-Adapted Interaction.

Manually Acquiring Targets From Multiple Viewpoints Using Video Feedback.
B. Ramesh, A. Konstant, P. Praveena, **E. Senft**, M. Gleicher, B. Mutlu, M. Zinn, and R. Radwin
Human Factors.

2021 **Task-Level Authoring for Remote Robot Teleoperation.**
E. Senft, M. Hagenow, K. Welsh, R. Radwin, M. Zinn, M. Gleicher, and B. Mutlu
Frontiers in Robotics and AI.

LEADOR: A Method for End-to-End Participatory Design of Autonomous Social Robot.
E. Senft, K. Winkle, and S. Lemaignan
Frontiers in Robotics and AI.

Informing Real-Time Corrections in Corrective Shared Autonomy Through Expert Demonstrations.
M. Hagenow, **E. Senft**, R. Radwin, M. Gleicher, B. Mutlu, and M. Zinn
IEEE Robotics and Automation Letters 6 (4), 6442-6449.

Corrective Shared Autonomy for Addressing Task Variability.
M. Hagenow, **E. Senft**, R. Radwin, M. Gleicher, B. Mutlu, and M. Zinn
IEEE Robotics and Automation Letters 6 (2), 3720-3727.

A Socially Assistive Robot for Long-Term Cardiac Rehabilitation in the Real World.
N. Céspedes, B. Irfan, **E. Senft**, C.A. Cifuentes, L.F. Gutiérrez, M. Rincon-Roncancio, T. Belpaeme, and M. Múnera
Frontiers in Neurorobotics 15, 21.

Assessing Limited Visibility Feedback for Overhead Manufacturing Assembly Tasks.
P. Bhat, **E. Senft**, M. Zinn, M. Gleicher, B. Mutlu, R. Cook, and R. Radwin
Applied Ergonomics.

2020 **Social Assistive Robots: Assessing the Impact of a Training Assistant Robot in Cardiac Rehabilitation.**
J. Casas, **E. Senft**, L.F. Gutiérrez, M. Rincon-Roncancio, M. Múnera, T. Belpaeme, and C.A. Cifuentes
International Journal of Social Robotics.

The DREAM Dataset: Supporting a Data-Driven Study of Autism Spectrum Disorder and Robot Enhanced Therapy.
E. Billing, ... , **E. Senft**, ... , and T. Ziemke
PloS one 15 (8), e0236939.

2019 **Teaching Robots Social Autonomy From in Situ Human Guidance.**
E. Senft, S. Lemaignan, P. Baxter, and T. Belpaeme
Science Robotics 4 (35).

Generating Spatial Referring Expressions in a Social Robot: Dynamic vs Non-Ambiguous.
C.D. Wallbridge, S. Lemaignan, **E. Senft**, and T. Belpaeme
Frontiers in Robotics and AI 6 (2019): 67.

Robot-Enhanced Therapy: Developing and Validating a Supervised Autonomous Robotic System for Autism Spectrum Disorders Therapy.
H.L. Cao, ... , **E. Senft**, ... , and T. Ziemke
EEE Robotics & Automation Magazine, vol. 26, no. 2.

2018 **The PInSoRo dataset: Supporting the Data-Driven Study of Child-Child and Child-Robot Social Dynamics.**
S. Lemaignan, C. Edmunds, **E. Senft**, and T. Belpaeme
PloS one 13 (10), e0205999.

A Personalized and Platform-Independent Behavior Control System for Social Robots in Therapy: Development and Applications.
H.L. Cao, G. Van de Perre, J. Kennedy, **E. Senft**, P.G. Esteban, A. De Beir, R. Simut, T. Belpaeme, D. Lefeber, and B. Vanderborght
IEEE Transactions on Cognitive and Developmental Systems 11 (3).

2017 **Supervised Autonomy for Online Learning in Human-Robot Interaction.**
E. Senft, P. Baxter, J. Kennedy, S. Lemaignan, and T. Belpaeme
Pattern Recognition Letters.

How to Build a Supervised Autonomous System for Robot-Enhanced Therapy for Children with Autism Spectrum Disorder.
P.G. Esteban, ... , **E. Senft**, ... , and T. Ziemke
Paladyn, Journal of Behavioral Robotics. De Gruyter Open.

Conferences

2024 **A System for Human-Robot Teaming through End-User Programming and Shared Autonomy.**
M. Hagenow, textbfE. Senft, R. Radwin, M. Gleicher, M. Zinn, and B. Mutlu
Accepted at the ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2023.

2023 **Situated Participatory Design: A Method for In Situ Design of Robotic Interaction with Older Adults.**
L. Stegner, **E. Senft**, and B. Mutlu
Proceedings of the ACM CHI Conference on Human Factors in Computing Systems, 2023.

2022 **A Method For Automated Drone Viewpoints to Support Remote Robot Manipulation.**
E. Senft, M. Hagenow, P. Praveena, R. Radwin, M. Zinn, M. Gleicher, and B. Mutlu
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022.

Registering Articulated Objects With Human-in-the-loop Corrections.
M. Hagenow, **E. Senft**, E. Laske, K. Hambuchen, T. Fong, R. Radwin, M. Gleicher, B. Mutlu, and M. Zinn
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022.

Understanding Control Frames in Multi-Camera Robot Telemanipulation.
P. Praveena, L. Molina, Y. Wang, **E. Senft**, B. Mutlu, and M. Gleicher
ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2022.

2021 **Situated Live Programming for Human-Robot Collaboration.**
E. Senft, M. Hagenow, R. Radwin, M. Zinn, M. Gleicher, and B. Mutlu
ACM Symposium on User Interface Software and Technology (UIST), 2021.

2020 **Would You Mind Me if I Pass by You? Socially-Appropriate Behaviour for an Omni-based Social Robot in Narrow Environment.**
E. Senft, S. Satake, and T. Kanda
ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2020.

Using a Personalised Socially Assistive Robot for Cardiac Rehabilitation: A Long-Term Case Study.
B. Irfan, N. Céspedes, J. Casas, **E. Senft**, L.F. Gutiérrez, M. Rincon-Roncancio, M. Múnera, T. Belpaeme, and C.A. Cifuentes
International Symposium on Robot and Human Interactive Communication (RO-MAN), 2020.

2018 **Social Psychology and Human-Robot Interaction: an Uneasy Marriage.**
B. Irfan, J. Kennedy, S. Lemaignan, F. Papadopoulos, **E. Senft**, and T. Belpaeme
ACM/IEEE International Conference on Human-Robot Interaction (alt.HRI), 2018.

Architecture for a Social Assistive Robot in Cardiac Rehabilitation.
J. Casas, N. Céspedes, **E. Senft**, B. Irfan, L.F. Gutiérrez, M. Rincón, M. Múnera, T. Belpaeme, and C.A. Cifuentes
IEEE Colombian Conference on Robotics and Automation, 2018.

2017 **Child Speech Recognition in Human-Robot Interaction: Evaluations and Recommendations.**
J. Kennedy, S. Lemaignan, C. Montassier, P. Lavalade, B. Irfan, F. Papadopoulos, **E. Senft**, and T. Belpaeme
ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2017.

Sensor Interface for Cardiac Rehabilitation Monitoring: Pilot Clinical Study.
J. Lara, J. Casas, M. Múnera, **E. Senft**, B. Irfan, L.F. Gutiérrez, L. Pinzón, T. Belpaeme, M. Rincon, and C.A. Cifuentes
Congreso Iberoamericano de Tecnologías de Apoyo a la Discapacidad (IBERDISCAP), 2017.

Human-Robot Sensor Interface for Cardiac Rehabilitation.
J. Lara, J. Cases, A. Aguirre, M. Múnera, M. Rincon-Roncancio, B. Irfan, **E. Senft**, T. Belpaeme, and C.A. Cifuentes
IEEE International Conference on Rehabilitation Robotics (ICORR), 2017.

2016 **Social Robot Tutoring for Child Second Language Learning.**
J. Kennedy, P. Baxter, **E. Senft**, and T. Belpaeme
ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2016.

From Characterising Three Years of HRI to Methodology and Reporting Recommendations.
P. Baxter, J. Kennedy, **E. Senft**, S. Lemaignan, and T. Belpaeme
ACM/IEEE International Conference on Human-Robot Interaction (alt.HRI), 2016.

2015 **SPARC: Supervised Progressively Autonomous Robot Competencies.**
E. Senft, P. Baxter, J. Kennedy, and T. Belpaeme
International Conference on Social Robotics (ICSR), 2015.

Higher Nonverbal Immediacy Leads to Greater Learning Gains in Child-Robot Tutoring Interactions.
J. Kennedy, P. Baxter, **E. Senft**, and T. Belpaeme
International Conference on Social Robotics (ICSR), 2015.

Touchscreen-Mediated Child-Robot Interactions Applied to ASD Therapy.
P. Baxter, S. Matu, **E. Senft**, C. Costescu, J. Kennedy, D. David, and T. Belpaeme
International Conference on Social Robots in Therapy and Education, 2015.

2013 **An Experimental Study on the Role of Compliant Elements on the Locomotion of the Self-Reconfigurable Modular Robots Roombots.**
M. Vespignani, **E. Senft**, S. Bonardi, R. Möckel, and A. Ijspeert
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2013.

Posters and Workshops

2023 **Towards Improved Replicability of Human Studies in Human-Robot Interaction: Recommendations for Formalized Reporting.**
S. Bagchi, P. Holthaus, G. Beraldo, **E. Senft**, D. Hernández García, Z. Han, S. Kumaar Jayaraman, A. Rossi, C. Esterwood, A. Andriella, and P. Pridham
Extended abstract (Late Breaking Report) at HRI, 2023.

Human-Robot Collaboration in a Sanding Task.
A. Konstant, N. Orr, M. Hagenow, E. Senft, I. Gundrum, B. Mutlu, M. Zinn, M. Gleicher, R. G. Radwin
Proceedings of the Human Factors and Ergonomics Society Annual Meeting.

2021 **Robotic Assistance Improves Cardiovascular Function Compared To Conventional Cardiac Rehabilitation Programs.**
B. Irfan, N. Cespedes Gomez, J.A. Casas, **E. Senft**, D. Sanchez, M. Rincon-Roncancio, L.F. Gutierrez, C.A. Cifuentes, T. Belpaeme, and M. Munera
Circulation 144, 2021.

2019 **Towards Generating Spatial Referring Expressions in a Social Robot: Dynamic vs Non-Ambiguous.**
C.D. Wallbridge, S. Lemaignan, **E. Senft**, and T. Belpaeme
Extended abstract at HRI (Late Breaking Report), 2019.

2018 **From Evaluating to Teaching: Rewards and Challenges of Human Control for Learning Robots.**
E. Senft, S. Lemaignan, P. Baxter, and T. Belpaeme
Human/Robot in the loop Machine Learning Workshop at IROS, 2018.

Robots in the Classroom: Learning to Be a Good Tutor.
E. Senft, S. Lemaignan, M. Bartlett, P. Baxter, and T. Belpaeme
Robot for Learning Workshop at HRI, 2018.

Social Assistive Robot for Cardiac Rehabilitation: A Pilot Study with Patients with Angioplasty.
J. Casas, B. Irfan, **E. Senft**, L.F. Gutiérrez, M. Rincon-Roncancio, M. Múnera, T. Belpaeme, and C.A. Cifuentes
Personal Robots for Exercising and Coaching Workshop at HRI, 2018.

Towards a SAR System for Personalized Cardiac Rehabilitation: A Patient with PCI.
J. Casas, B. Irfan, **E. Senft**, L.F. Gutiérrez, M. Rincon-Roncancio, M. Múnera, T. Belpaeme, and C.A. Cifuentes
Extended abstract at HRI (Late Breaking Report), 2018.

2017 **Toward Supervised Reinforcement Learning with Partial States for Social HRI.**
E. Senft, S. Lemaignan, P. Baxter, and T. Belpaeme
AI-HRI Symposium at AAAI FSS, 2017.

Leveraging Human Inputs in Interactive Machine Learning for Human Robot Interaction.
E. Senft, S. Lemaignan, P. Baxter, and T. Belpaeme
Extended abstract at HRI (Late Breaking Report), 2017.

2016 **SPARC: An Efficient Way to Combine Reinforcement Learning and Supervised Autonomy.**
E. Senft, S. Lemaignan, P. Baxter, and T. Belpaeme
Future of Interactive Learning Machines Workshop at NIPS, 2016.

Providing a Robot with Learning Abilities Improves its Perception by Users.
E. Senft, P. Baxter, J. Kennedy, S. Lemaignan, and T. Belpaeme
Extended abstract at HRI (Late Breaking Report), 2016.

Heart vs Hard Drive: Children Learn More From a Human Tutor Than a Social Robot.
J. Kennedy, P. Baxter, **E. Senft**, and T. Belpaeme
Extended abstract at HRI (Late Breaking Report), 2016.

Socially Contingent Humanoid Robot Head Behaviour Results in Increased Charity Donations.
P. Wills, P. Baxter, J. Kennedy, **E. Senft**, and T. Belpaeme
Extended abstract at HRI (Late Breaking Report), 2016.

2015 **Using Immediacy to Characterise Robot Social Behaviour in Child-Robot Interactions.**
J. Kennedy, P. Baxter, **E. Senft**, and T. Belpaeme
Workshop on Evaluating Child-Robot Interaction at ICSR, 2015.

The Wider Supportive Role of Social Robots in the Classroom for Teachers.
P. Baxter, E. Ashurst, J. Kennedy, **E. Senft**, S. Lemaignan, and T. Belpaeme
Workshop on Evaluating Child-Robot Interaction at ICSR, 2015.

Human-Guided Learning of Social Action Selection for Robot-Assisted Therapy.
E. Senft, P. Baxter, and T. Belpaeme
Machine Learning for Interactive Systems Workshop at ICML, 2015.

When is it Better to Give Up? Autonomous Action Selection for Robot Assisted ASD Therapy.
E. Senft, P. Baxter, J. Kennedy, and T. Belpaeme
Pioneers Workshop at HRI, 2015.