

Bahar Irfan

ROBOTICIST (PHD), COMPUTER ENGINEER (MSc), AND MECHANICAL ENGINEER (BSc)

✉ r.bahar.irfan@gmail.com 📞 +46 727805162 🏠 bahairfan.com 🌐 bahar-irfan 🔄 birfan 📄 Bahar Irfan 📍 Stockholm, Sweden

SUMMARY

Robotist, computer engineer and mechanical engineer with a goal to create personal robots that learn and adapt to assist in everyday life. 9 years of research experience with a focus on multi-modal personalization in long-term human-robot interaction, continual learning, conversational AI, real-world deployments, user-centered design, task planning, and building robots.

SKILLS

Soft Skills: Creativity Determination Critical thinking Leadership Collaboration Adaptability Communication

Technical Skills: Python C++ PyTorch C ROS Gazebo MoveIt Docker Git MATLAB R MySQL Java

PROFESSIONAL EXPERIENCE

Postdoctoral Researcher and Digital Futures Fellow

June 2022 – Present

KTH Royal Institute of Technology (Sweden)

- Developing a lifelong learning model for long-term personalization in open-domain dialogue with large language models.
- Conducted participatory design studies with 34 older adults to develop a personal companion robot based on their needs [1].
- Identified the challenges of applying large language models to robots using questionnaires and 15 hours of video data [1].

Research and Development Associate

February 2020 – May 2022

Evinoks Service Equipment Industry and Commerce Inc. (Turkey)

- Developed customized software for industrial robots, virtual reality, and smart buffets to increase flexibility for customers.

Research and Development Lab Associate

July 2019 – November 2019

Disney Research Los Angeles (USA)

- Developed a reinforcement learning model for dynamic and personalized emotional adaptation in dialogue for long-term interactions of a virtual interactive character, based on users' and agent's emotional models and personality [6].

Early-Stage Researcher

April 2016 – May 2019

University of Plymouth (UK) and SoftBank Robotics Europe (France)

- Evaluated personalization, continual learning, and few-shot learning in data-driven models for task-oriented dialogue [2].
- Developed the first multi-modal open world user recognition model with incremental and online learning, which improved identification by 48% on benchmark, reached 94% accuracy in human-robot interaction, and decreased bias [3]. 🔄
- Created open-source benchmark datasets for task-oriented dialogue [2] and multi-modal long-term user recognition [3]. 🔄 🔄
- Supervised a MSc intern for 6 months to develop a personal barista Pepper robot with a rule-based dialogue manager [7].
- Developed social and personal autonomous robots for long-term cardiac rehabilitation in collaboration with international researchers and medical specialists, which improved 17 patients' health and motivation at a hospital in 2.5 years [4] [5].
- Coordinated 2 workshops, co-organized 2 summer schools and HRI conference, supported teaching in 2 robotics courses.

Research and Teaching Assistant

February 2014 – February 2016

Bogazici University (Turkey)

- Developed a dishwasher loading robot in simulation with user-centered design for task planning and manipulation.
- Implemented motion planning and behavior planning for NAO robots at RoboCup robot football competition for 2 years.
- Supported teaching in 6 BSc computer engineering classes with over 70 students each, and volunteered at 3 conferences.

EDUCATION

PhD in Computing (*Specialization: Human-Robot Interaction*)

April 2016 – December 2020

University of Plymouth (UK)

Passed with no corrections

MSc in Computer Engineering (*Specialization: AI and Robotics*)

September 2012 – March 2016

Bogazici University (Turkey)

GPA: 3.69 (over 4.0)

BSc in Mechanical Engineering (*Specialization: Mechatronics*)

September 2007 – June 2012

Bogazici University (Turkey) with placement at Purdue University (USA) *Graduated as 3rd in class, GPA: 3.62 (over 4.0)*

- Designed and built mobile educational robots that are still used in the robot control course at the university for over 10 years.

SELECTED ORGANIZATIONS AND INVITED TALKS

Lifelong Learning and Personalization in Long-Term Human-Robot Interaction workshop

Coordinator, Co-organizer, Panel Moderator, International Conference on Human-Robot Interaction March 2021 – 2023

- The workshop had 70 to 100 attendees each year. It is the most popular workshop at HRI. Experts from academia (e.g., MIT, Stanford, Yale) and industry (e.g., Google, Sony, Toyota Research Institute) presented and participated in the panels.

Personalisation in Long-Term Human-Robot Interaction: Challenges and Suggestions

Invited speaker, SoftBank Robotics Europe Humanizing Technology And Robots Talk (HEART) webinar February 2021

- 120 people attended my virtual seminar.

Personalization in Long-Term Human-Robot Interaction workshop

Coordinator and Co-organizer, International Conference on Human-Robot Interaction (HRI)

March 2019

- 40 people attended the full-day workshop in person, which was the most popular workshop at HRI 2019.

FELLOWSHIPS AND AWARDS

Digital Futures Postdoc Fellowship

KTH Royal Institute of Technology

June 2022 – June 2024

Second prize at Three Minute Thesis competition

University of Plymouth

May 2020

Winning project proposal contributor – University was awarded a Pepper robot (\$20,000)

EPSRC Robotics & Autonomous Systems Network Social Care Challenge

April 2017


EU H2020 Marie Skłodowska-Curie Actions Innovative Training Networks Fellowship

Applications of Personal Robotics for Interaction and Learning (APRIL), University of Plymouth

April 2016 – May 2019

PUBLICATIONS

Journal Articles (5 of 5)

- [1] **B. Irfan**, S-M. Kuoppamäki, and G. Skantze, “Between Reality and Delusion: Challenges of Applying Large Language Models to Companion Robots for Open-Domain Dialogues with Older Adults”, *Autonomous Robots* (under review). 
- [2] **B. Irfan**, M. Hellou, and T. Belpaeme, “Coffee with a Hint of Data: Towards Using Data-Driven Approaches in Personalised Long-Term Interactions”, *Frontiers in Robotics and AI* (2021).
- [3] **B. Irfan**, M. Garcia Ortiz, N. Lyubova, and T. Belpaeme, “Multi-modal Open World User Identification”, *Transactions on Human-Robot Interaction* (2021).
- [4] **B. Irfan**, N. Céspedes, J. Casas, E. Senft, C. A. Cifuentes, L. F. Gutierrez, M. Rincon-Roncancio, T. Belpaeme, and M. Munera, “Personalised Socially Assistive Robot for Cardiac Rehabilitation: Critical Reflections on Long-Term Interactions in the Real World”, *User Modeling and User-Adapted Interaction* (2022).
- [5] N. Céspedes, **B. Irfan**, E. Senft, C. A. Cifuentes, L. F. Gutierrez, M. Rincon-Roncancio, T. Belpaeme, and M. Munera, “A Socially Assistive Robot for Long-Term Cardiac Rehabilitation in the Real World”, *Frontiers in Neurobotics* (2021).

Conference Proceedings (2 of 14)

- [6] **B. Irfan**, A. Narayanan, and J. Kennedy, “Dynamic Emotional Language Adaptation in Multiparty Interactions with Agents”, *ACM International Conference on Intelligent Virtual Agents* (2020).
- [7] **B. Irfan**, M. Hellou, A. Mazel, and T. Belpaeme, “Challenges of a Real-World HRI Study with Non-Native English Speakers: Can Personalisation Save the Day?”, *International Conference on Human-Robot Interaction (HRI)* (2020).