Artin Saberpour Abadian

PhD candidate at Human Computer Interaction Lab

(+49) 157-355-46170 | saberpour@cs.uni-saarland.de | Google Scholar

Research Interests

I study how robotic systems can behave in ways that feel intuitive and natural to humans, with a focus on understanding the behavioral and contextual cues that shape human perception of robot motion, and using these insights to design more seamless and ergonomic interactions

Keywords: Human–Robot Interaction (HRI), Generative Models for Robotics, Multimodal Perception, Human Motion Modeling, **Embodied AI**, Scene Understanding, Wearable Robotics

Education

HCI Lab, Saarland university — **Saarbrücken, Germany**

PhD candidate in computer science at HCI lab — *Jan 2021 - Now*

Saarland university — **Saarbrücken, Germany**

M.Sc. in Computer Science — *Apr 2017 - Dec 2020*

GPA: 1.8 in German grading system

University of Tehran — **Tehran, Iran**

B.Sc. in Computer (hardware) Engineering — *2008 - 2013*

Last 5 Semesters' GPA: 16.09/20.0

Publications

[1] ***Context-Aware Adaptive Handovers with Supernumerary Robotic Limbs using VLMs***
A. Saberpour, A. Ram, B. Koyuncu, I. Valera, M. Schmitz, J. Steimle
(Under submission) IEEE Robotics and Automation Letters (RA-L)

[2] ***GestureCoach: Rehearsing for Engaging Talks with LLM Driven Gesture Recommendations***
A. Ram, V. Suresh, **A. Saberpour**, V. Demberg, J. Steimle
UIST '25: Proceedings of the 38th Annual ACM Symposium on User Interface Software and Technology

[3] ***3HANDS Dataset: Learning from Humans for Generating Naturalistic Handovers with Supernumerary Robotic Limbs***
A. Saberpour, Y-C Liao, A. Otaran, R. Dabral, M. Muehlhaus, C. Theobalt, M. Schmitz, J. Steimle
CHI '25: Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems

[4] ***WRLKit: Computational Design of Personalized Wearable Robotic Limbs***
A. Saberpour, A. Otaran, M. Schmitz, M. Muehlhaus, R. Dabral, D. Luvizon, A. Maekawa, M. Inami, C. Theobalt, J. Steimle
UIST '23: Proceedings of the 36th Annual ACM Symposium on User Interface Software and Technology

[5] ***I Need a Third Arm! Eliciting Body-based Interactions with a Wearable Robotic Arm***
M. Muelhaus, M. Koelle, **A. Saberpour**, J. Steimle
CHI '23: Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems

[6] ***Fabrication of Moiré on Curved Surfaces***
A. Saberpour, R. D. Hersch, J. Fang, R. Zayer, H. Seidel, V. Babaei
Optics Express 28, 13 (2020), 19413-19427

Patents

Fabrication of Moiré on Curved Surfaces — **US Patent**

Artin Saberpour Abadian, Vahid Babaei, Roger D. Hersch, Rhaleb Zayer, Hans-Peter Seidel — *Pub. No.: US 2022/0355609 A1*

Research Experience

Saarland University — **Saarbrücken, Germany**

PhD researcher in Wearable Robotics — *Jan 2021 - Now*

- Conducted research on **supernumerary robotic limbs (SRLs)**, focusing on **naturalistic integration of robotic extensions with the human body.**
- Developed **generative and optimization-based motion models** that enable SRLs to perform fluid, context-aware, and human-like interactions during shared motor tasks.
- Led the design and implementation of the **3HANDS dataset**, capturing 946 multimodal human handovers while performing 12 daily activities for robot learning.
- Managed collaborative projects across generative behavior modeling, embodied interaction, and SRL usability domains.

Max Planck Institute for Informatics (MPII), Graphics Dept. — Saarbrücken, Germany

Research Assistant — *Jul 2019 - Dec 2020*

- **Developed the full pipeline for digital fabrication of Moiré on curved surfaces**, optimizing fabrication parameters through automated physics-based rendering and perceptual evaluation.
- First authored the paper **"Fabrication of moiré on curved surfaces"**, demonstrating programmable, fabrication-aware surface patterning.
- Contributed to a **U.S. patent** involving fabrication planning and parameter optimization workflows.
- Conducted exploratory research on **inverse geometry optimization and differentiable rendering**, modeling shape parameters for fabrication-aware design.

Max Planck Institute for Informatics (MPII), Algorithms and Complexity Dept. — Saarbrücken, Germany

Research Assistant — *Mar 2018 - Jun 2019*

- Implemented a **Mixer Numerically Controlled Oscillator (Mixer NCO)** in VHDL, with signal analysis and verification performed in C.
- Explored possible solutions to **reduce quantization and DAC-induced noise**, improving output waveform stability for embedded communication systems.

Korean Institute for Science and Tech. (KIST Europe) — Saarbrücken, Germany

Research Assistant — *Dec 2017 - Feb 2018*

- Developed the **MixExpo web tool**, including interactive visualization components and backend integration for data-driven exhibition interfaces.

Teaching Experience

Interactive Systems Course (6 CP), Saarland University — Saarbrücken, Germany

Teaching Assistant — *Summer 2022*

- Led **discussion sections and hands-on lab sessions** covering interactive systems design and prototyping.
- Designed and revised **assignments, exams, and course activities**, improving concept reinforcement and assessment clarity.
- **Graded coursework and final exams**, and held regular office hours to provide mentoring and project guidance.
- Supervised **student research and final project teams**, supporting project scoping, hardware integration, and experimental evaluation.
- Assisted with **hardware setup and troubleshooting** for interactive systems demonstrations and prototypes.
- Recompiled and updated **course teaching materials** and documentation, and **managed the course webpage** and submission workflow.

Getting Hands-On with Wearable Robotics for Augmenting Human Capabilities, Saarland University — Saarbrücken, Germany

Seminar Organizer — *Summer 2023*

- Organized and co-led a graduate-level seminar focused on **wearable robotics, augmentation, and embodied interaction**.
- Designed seminar format, curated reading lists, and led weekly **student discussion and hands-on sessions**.
- Supervised **group research projects**, supporting concept development, prototyping, study design, and presentations.
- Assisted students with **hardware integration**, embodiment testing, and evaluation workflows.

Engineering of Interactive Systems with Generative AI, Saarland University — Saarbrücken, Germany

Seminar Co-organizer — *Summer 2023*

- Co-designed seminar content on **generative models, interaction design, and AI-assisted prototyping**.
- Mentored student teams through project ideation, prototype development, and evaluation.
- Created and graded seminar assignments and provided individualized research guidance.

Supervised students — Saarbrücken, Germany

Master's Theses — *Summer 2023*

- Moaz Bin Younus – **Neuroplastic Adaptation Through BCI Training with a Supernumerary Robotic Arm** (Saarland University, 2025)
- Alireza Parchami – **In-car Augmented Reality** (Saarland University, 2025)

Bachelor's Theses

- Bilal Alshikh – **Developmental Insights into Three Handed Functionality using Reinforcement Learning** (Saarland University, July 2025)

Interns

- Claire Chen – **Visiting Intern from Massachusetts Institute of Technology** (Saarland University, July 2024)

Service to the Academic Community

Peer Review

- Reviewer, **IEEE Transactions on Automation Science and Engineering**, 2025
- Reviewer, **The ACM International Conference on Mobile Human-Computer Interaction (MobileHCI)**, 2025
- Reviewer, **Learning for Dynamics and Control**, 2025
- Reviewer, **Augmented Humans International Conference**, 2025

Technical Skills

Embodied AI & Generative Modeling	Generative motion models (CVAE, diffusion, transformer-based), human–robot handover synthesis, intent prediction, representation learning for embodied interaction
Robotics & Control	Kinematic and dynamic modeling, trajectory optimization, real-time control, human-robot collaboration.
Simulation & Graphics	MuJoCo, Skeleton pose processing, Unity physics simulation, Blender asset pipelines, physically-based rendering workflows, Differentiable rendering (e.g. Redner)
Computational Design & Fabrication	Body-aware robotic design optimization, additive and subtractive manufacturing, mold-casting
Programming	Python, C/C++, C#, MATLAB, R, Verilog, VHDL
ML Frameworks & Tooling	PyTorch, TensorFlow, CUDA, Git

Language Skills

Persian	*Mother Tongue*
Azerbaijani	*Native Speaker*
English	*Fluent*
Turkish	*Fluent*
German	*Intermediate Level*
Arabic	*Familiar*

References

Prof. Dr. Jürgen Steimle — **HCI Lab, Saarland university**
steimle(at)cs.uni-saarland.de

Dr. Vahid Babaei — **Max Planck Institute**
vbabaei(at)mpi-inf.mpg.de

Prof. Dr. Martin Schmitz — **University of Koblenz**
martin(at)uni-koblenz.de