

Simon Stepputtis

PHD STUDENT · COMPUTER SCIENCE · ARIZONA STATE UNIVERSITY

✉ sstepput@asu.edu | 🌐 simonstepputtis.com | in simon-stepputtis | Google Scholar

Education

PhD Student in Computer Science

Tempe, AZ, USA

Since January 2017

Projected: Spring 2021

ARIZONA STATE UNIVERSITY

- **Focus** — My research focuses on the synergies between Human-Robot Interaction and Natural Language Processing
- In my work, I designed an end-to-end approach to translate natural language into low-level robot control policies
- Additionally, I'm working on applying transfer learning approaches to generalize these policies towards multiple robots

Master of Science in Engineering & Computing

Freiberg, SA, Germany

March 2015 - November 2016

TU BERGAKADEMIE FREIBERG

- **Thesis** — *A data driven approach for triadic interactions in human robot interaction*
- This thesis deals with the question of how to reason about an additional object in classic Human-Robot Interaction
- Specifically, I designed a system for natural handover tasks between robots and humans

Bachelor of Science in Engineering & Computing

Freiberg, SA, Germany

October 2011 - March 2015

TU BERGAKADEMIE FREIBERG

- **Thesis** — *Upper body tracking for avatar visualization in HMD-based virtual reality*
- In this thesis I designed a approach that allows users to have a realistic virtual body while being immersed in HMD-based virtual reality
- A core component of this work is to bridge the reality gap between the users movement in the real and virtual world

Experience

RESEARCH EXPERIENCE

Research Associate

Tempe, AZ, USA

2017 - Present

ARIZONA STATE UNIVERSITY

Since January 2017 I have worked on various projects at the Interactive Robotics Lab in the field of Human Robot Interaction, Natural Language Processing, Machine Learning and Artificial Intelligence:

- Designed and developed an end-to-end approach to synthesize robot controllers from language and visual perception, allowing robots to engage in natural Human-Robot Collaboration (Python, TensorFlow)
- Developed a deep learning approach to allow robots to perform in-hand object manipulation based on tactile sensor data by utilizing slip (Python, Keras, ROS)
- Build an exo-skeleton for astronauts by developing intelligent hardware and software components that assist and empower human cognition, dexterity and ingenuity (Python, C, C++, ROS)

Robert Bosch LLC

Sunnyvale, CA, USA

May 2018 - August 2018

ROBOTICS INTERN

During this internship, I worked on segmenting time series data into semantic sections while evaluating global goal constraints (Python, TensorFlow)

- Created a deep learning approach to detect change points in data streams.
- Classified groups of semantic segments into high-level tasks
- Designed a robust system for partially ordered tasks
- Validated user behaviors based classified high-level tasks

Apromace Data Systems GmbH

SOFTWARE ENGINEER INTERN

Freiberg, SA, Germany
September 2016 - December 2016

During this internship, I worked on Linux UI development (C++, Qt5)

- Created user interfaces for high-throughput data processing applications
- Developed back-end solutions for efficient data processing
- Created responsive interfaces for large data visualization
- Developed cross-platform graphical user interfaces for Windows, Mac and Linux

Research Assistant

TU FREIBERG | FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Freiberg, Germany
Summer 2014 - Winter 2016

I worked as a research assistant in the Humanoid Robotics Group Freiberg:

- Created a distributed software system for human motion capture with multiple Microsoft Kinect cameras (C++, Qt5)
- Contributed to HRI research by developing a system for semantic task detection and fluid control transitions between different tasks
- Created a data loading module for scientific fluid simulations in 3D environments (C++)

TEACHING EXPERIENCE

Teaching Assistant

ARIZONA STATE UNIVERSITY

Tempe, AZ, USA
2017 - Present

My passion for teaching has led me to work as a teaching Assistant at Arizona State University on multiple occasions. Duties included creating course materials like homework, quizzes, midterms, and finals, as well as designing various programming projects (Python, MatLab, Java).

- Introduction to Theoretical Computer Science (Spring 2018, 2019, 2020)
- Artificial Intelligence (Fall 2017)
- Advances in Robot Learning (Spring 2017)
- Object Orientated Programming and Data Structures (Spring 2017)

Teaching Assistant

TU FREIBERG | FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Freiberg, Germany
Winter 2012, Winter 2013

Lead tutorials for *Basics of Computer Science* (C, Objective-C)

Publications

JOURNALS

One-shot Learning of Human-Robot Handovers with Triadic Interaction Meshes

DAVID VOGT, SIMON STEPPUTTIS, BERNHARD JUNG, HENI BEN AMOR

Autonomous Robots Journal (AURO)
January 2018

CONFERENCE PAPERS

Learning Interactive Behaviors for Musculoskeletal Robots Using Bayesian Interaction Primitives

JOSEPH CAMPBELL, ARNE HITZMANN, SIMON STEPPUTTIS, SHUHEI IKEMOTO, KOH HOSODA, HENI BEN AMOR

IEEE: Intelligent Robots and Systems (IROS)
November 2019

Improved Exploration through Latent Trajectory Optimization in Deep Deterministic Policy Gradient

KEVIN SEBASTIAN LUCK, MEL VECERIK, SIMON STEPPUTTIS, HENI BEN AMOR, JONATHAN SCHOLZ

IEEE: Intelligent Robots and Systems (IROS)
November 2019

Probabilistic Multimodal Modeling for Human-Robot Interaction Tasks

JOSEPH CAMPBELL, SIMON STEPPUTTIS, HENI BEN AMOR

Robotics: Science and Systems (RSS)
June 2019

Extrinsic Dexterity through Active Slip Control using Deep Predictive Models

SIMON STEPPUTTIS, YEZHOU YANG, HENI BEN AMOR

Conference on Robotics and Automation (ICRA)
May 2018

A System for Learning Continuous Human-Robot Interactions from Human-Human Demonstrations

DAVID VOGT, SIMON STEPPUTTIS, STEVE GREHL, BERNHARD JUNG, HENI BEN AMOR

Conference on Robotics and Automation (ICRA)

May 2017

Learning Human-Robot Interactions from Human-Human Demonstrations (with Applications in Lego Rocket Assembly)

DAVID VOGT, SIMON STEPPUTTIS, RICHARD WEINHOLD, BERNHARD JUNG, HENI BEN AMOR

Conference on Humanoid Robotics (Humanoids)

November 2017

WORKSHOPS AND SYMPOSIUMS

Imitation Learning of Robot Policies by Combining Language, Vision and Demonstration

SIMON STEPPUTTIS, JOSEPH CAMPBELL, MARIANO PHIELIPP, CHITTA BARAL, HENI BEN AMOR

NeurIPS Workshop on Robot Learning

December 2019

Neural Policy Translation for Robot Control

SIMON STEPPUTTIS, CHITTA BARAL, HENI BEN AMOR

Southwest Robotics Symposium

January 2019

Towards Semantic Policies for Human-Robot Collaboration

SIMON STEPPUTTIS, CHITTA BARAL, HENI BEN AMOR

Southwest Robotics Symposium

January 2018

Speech Enhanced Imitation Learning and Task Abstraction for Human-Robot Interaction

SIMON STEPPUTTIS, CHITTA BARAL, HENI BEN AMOR | WORKSHOP ON *Synergies Between Learning and Interaction*

Conference on Intelligent Robots and Systems (IROS)

October 2017

Deep Predictive Models for Active Slip Control

SIMON STEPPUTTIS, HENI BEN AMOR | WORKSHOP ON *(Empirically) Data-Driven Robotic Manipulation*

Robotics: Science and Systems (RSS)

July 2017

Active Slip Control for In-Hand Object Manipulation using Deep Predictive Models

SIMON STEPPUTTIS, HENI BEN AMOR | WORKSHOP ON *Tactile Sensing for Manipulation: Hardware, Modeling, and Learning*

Robotics: Science and Systems (RSS)

July 2017

UNDER REVIEW

International Conference on Learning Representations (ICLR)

UNDER DOUBLE-BLIND REVIEW

2019

Extracurricular Activities

MENTORING AND LEADERSHIP

CIDSE Graduate Student Mentorship Program

MENTOR

I am working as a mentor for junior PhD students and advise them regarding research, advisor selection and PhD life in general at the School of Computing, Informatics, and Decision Systems Engineering.

Arizona State University

August 2019 - Present

Student Supervision

ADVISED MULTIPLE STUDENTS DURING THEIR BACHELOR'S AND MASTER'S THESIS

During my work at the Interactive Robotics Lab I worked with five students and advised them during their bachelor's and/or master's thesis to achieve their individual research agendas.

Arizona State University

2017 - Present

OPEN-SOURCE PROJECTS

IntPrim

AN OPEN-SOURCE PYTHON LIBRARY FOR THE BAYESIAN INTERACTION PRIMITIVES FRAMEWORK

Arizona State University

2017 - Present

ACADEMIC SERVICES

Program Committee

WORKSHOP ON SYNERGIES BETWEEN LEARNING AND INTERACTION

I was part of the program committee for the workshop on synergies between learning and interaction at IROS 2017. My primary responsibility was to review the workshop contributions.

Intelligent Robots and Systems

October 2017

Conference Reviewer

IROS, ICRA, ROBOTICS AND AUTONOMOUS SYSTEMS JOURNAL

I reviewed conference papers at some of the major conferences in the field of robotics as well as journal papers for the Robotics and Autonomous Systems journal. Furthermore I reviewed workshop contributions for multiple workshops in the area of robotics.

Awards

Best Poster Award

AWARDED BY NVIDIA

This award was given by NVIDIA for my work on *Neural Policy Translation for Robot Control* presented at the Southwest Robotics Symposium 2019.

Southwest Robotics Symposium

January 2019

CIDSE Doctoral Fellowship

AWARDED BY THE SCHOOL OF COMPUTING, INFORMATICS, AND DECISION SYSTEMS ENGINEERING

Awarded 2017, 2018 and 2019 for excellent research progress and strong academic work by the "School of Computing, Informatics, and Decision Systems Engineering"

Arizona State University

January 2017, 2018 and 2019

Best Video Award

AWARDED BY THE IEEE-RAS INTERNATIONAL CONFERENCE ON HUMANOID ROBOTICS

Awarded by the conference on humanoid robotics (Humanoids) for our work on *Learning Human-Robot Interactions from Human-Human Demonstrations (with Applications in Lego Rocket Assembly)*

Humanoids

November 2016

Skills

Research	Published on multiple international conferences and journals (AURO, RSS, IROS, ICRA, Humanoids)
Leadership	I am working as a mentor for junior PhD students and advise students in the Interactive Robotics Lab
Frameworks	Tensorflow, Robot Operating System (ROS), Qt, Docker
Communication	Assisted in teaching multiple classes with individual student groups
Programming Languages	Python, C++, C, MatLab, Java
Teamwork and Collaboration	Worked on multiple joint research projects in Europe and the United States