Thomas Groechel

Contact Information

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Research Interests

Socially Assistive Robot (S.A.R.) Tutors, Virtual and Augmented Reality Robotics

Education

University of Southern California, Los Angeles, CA *July 2018 - Present*
– Ph.D. Computer Science,
– Research Advisor: Professor Maja J. Matarić

University of Michigan, Ann Arbor, MI *Sep 2014 - May 2018*
– B.S.E. Computer Science
– Undergraduate Research Advisor: Odest C. Jenkins

Experience

Graduate Researcher Interaction Lab Los Angeles, CA *July 2018 - Present*

- Created mixed reality robot tutor aiming to teach kids through movement
- Developed on and deployed telepresence robots in schools for home-bound students
- Supported in-home deployments of robot tutor for students with ASD

UG Researcher 4Progress Lab, Ann Arbor, MI *May 2016 - May 2018*

- Developed 2-D S.L.A.M. algorithm using Iterative Closest Point visualization
- Implemented Stochastic Gradient Descent to perform loop closure with Fetch 2-D map readings from Ed Olson's paper Fast Iterative Alignment of Pose Graphs with Poor Initial Estimates

Staff Development Czar and TA, Ann Arbor, MI *Sep 2016 - May 2018*

- Created and led "Staff Development" program for second level computer science staff to improve both new staff members as well as seasoned veterans
- Structured 35 student lab session to review and teach concepts in a specialized alternative to traditional lecture, tailoring for active self learning
- Produced class specific help and tip videos to give students an extra resource to common issues in a newer format

Robotics Software Intern at TRACLabs, Houston, TX *Summer 2017*

- Adapted local mapping and navigation to move TRACBot to maneuver dynamically through obstacles such as doors and people in order to reach/use items in Affordance Template library
- Refitted and rebuilt action server nodes into custom system to perform dynamic re-planning based upon real time observations

Student Research Mentoring

Current Undergraduates

– Roxanna Pakkar	Electrical Engineering, Merit Research Fellow
– Zhonghao Shi	Computer Science
– Chloe Kuo	Computer Science, Merit Research Fellow
– Julia Cordero	Computer Science, Merit Research Fellow
– Roddur Dasgupta	Computer Science
– Haemin Lee	Computer Science

Previous Students

- Ryan Stevenson — USC Computer Science Games
- Adnan Karim — University of Calgary Computer Science, SURE Student
- İpek Göktan — Highschool Student, USC SHINE Program
- Mena Hassan — Highschool Student, USC SHINE Program

Contributions to Grant Proposals

NSF NRI - Communicate, Share, Adapt: A Mixed Reality Framework for Facilitating Robot Integration and Customization

- Research grant awarded and based upon Ph.D. work Augmented Reality S.A.R.
- Outlined and contributed significant text to proposal

K-12 Educational Outreach

Microsoft TEALS Teaching Volunteer, Los Angeles, CA *July 2019-Present*

- Volunteer teaching program designed to teach a high school teacher from a non-CS background how to teach computer science
- AP Computer Science to students at Los Angeles Center for Enriched Studies

The Help Group STEM Academy, Los Angeles, CA *June 2019*

Monterey Hills Elementary Assembly, Los Angeles, CA *May 2019*

USC Robotics Academy Judge, Los Angeles, CA *Dec 2018, Apr 2019*

VEX Robotics Team Leader, Los Angeles, CA *Oct 2018 - Feb 2019*

Honors and Awards

USC George Bekey Service Award *2019*

Publications

[1] **Thomas R. Groechel**, Zhonghao Shi, Roxanna Pakkar, and Maja J. Matarić "Using Socially Expressive Mixed Reality Arms for Enhancing Low-Expressivity Robots", In 2019 IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN '19), New Delhi, India, Oct-2019.
Robotics Society of Japan and Korean Robotics Society Distiguished Interdiciplinary Research Award Finalist (3 nominated from 206)

Talks and Demos

Robots Visions & Voices Demo
University of Southern California *24 Oct 2019*

S.A.R. Through Augmented Reality Extensions Demo and Discussion
Public Affairs Council in Laguna Beach, CA *8-9 Jan 2019*

Professional Service

Workshop Organizer

- *Virtual Augmented and Mixed Reality (VAM) HRI*
- Proposed for **HRI 2020**

Tutorial Organizer

- *Adding Internal Human State to Create a Social, Physically-Situated, Human-Robot Interaction*
- Accepted for **IROS 2020**

Reviewer for these Conferences and Journals

- Science Robotics 2018

Women in US Academic Research in Robotics Website *July 2019 - Present*

- Created and maintain a list of current women in US academic robotics research
- Link: `us-women-in-robotics-research.github.io`