

## Thomas R Groechel

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### 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 TRAC Labs**, 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 USC Electrical Engineering, Merit Research Fellow
- Zhonghao Shi USC Computer Science
- Chloe Kuo USC Computer Science, Merit Research Fellow
- Julia Cordero USC Computer Science, Merit Research Fellow
- Roddur Dasgupta USC Computer Science
- Haemin Lee USC Computer Science

	<b>Previous Students</b> <ul style="list-style-type: none"> <li>– Ryan Stevenson USC Computer Science Games</li> <li>– Adnan Karim University of Calgary Computer Science, SURE Student</li> <li>– İpek Göktan Highschool Student, USC SHINE Program</li> <li>– Mena Hassan Highschool Student, USC SHINE Program</li> </ul>
CONTRIBUTIONS TO GRANT PROPOSALS	<b>NSF NRI 2.0 - Communicate, Share, Adapt: A Mixed Reality Framework for Facilitating Robot Integration and Customization</b> <ul style="list-style-type: none"> <li>– Research grant awarded and based upon Ph.D. work Augmented Reality S.A.R.</li> <li>– Outlined and contributed significant text to proposal</li> </ul>
K-12 EDUCATIONAL OUTREACH	<b>Microsoft TEALS Teaching Volunteer</b> , Los Angeles, CA <i>July 2019-Present</i> <ul style="list-style-type: none"> <li>– Volunteer teaching program designed to teach a high school teacher from a non-CS background how to teach computer science</li> <li>– AP Computer Science to students at Los Angeles Center for Enriched Studies</li> </ul> <b>The Help Group STEM Academy</b> , Los Angeles, CA <i>June 2019</i> <b>Monterey Hills Elementary Assembly</b> , Los Angeles, CA <i>May 2019, Nov 2019</i> <b>USC Robotics Academy Judge</b> , Los Angeles, CA <i>Dec 2018, Apr 2019</i> <b>VEX Robotics Team Leader</b> , Los Angeles, CA <i>Oct 2018 - Feb 2019</i>
HONORS AND AWARDS	<b>USC George Bekey Service Award</b> <i>2019</i>
PUBLICATIONS	[1] <b>Thomas R. Groechel</b> , 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. <b>Robotics Society of Japan and Korean Robotics Society Distinguished Interdisciplinary Research Award Finalist (3 nominated from 206)</b>
TALKS AND DEMOS	<b>Robots Visions &amp; Voices Demo</b> University of Southern California <i>24 Oct 2019</i> <b>S.A.R. Through Augmented Reality Extensions Demo and Discussion</b> Public Affairs Council in Laguna Beach, CA <i>8-9 Jan 2019</i>
PROFESSIONAL SERVICE	<b>Workshop Organizer</b> <ul style="list-style-type: none"> <li>– <i>Virtual Augmented and Mixed Reality (VAM) HRI</i></li> <li>– Proposed for <b>HRI 2020</b></li> </ul> <b>Tutorial Organizer</b> <ul style="list-style-type: none"> <li>– <i>Adding Internal Human State to Create a Social, Physically-Situated, Human-Robot Interaction</i></li> <li>– Accepted for <b>IROS 2020</b></li> </ul> <b>Reviewer for these Conferences and Journals</b> <ul style="list-style-type: none"> <li>– Science Robotics 2018</li> </ul> <b>Women in US Academic Research in Robotics Website</b> <i>July 2019 - Present</i> <ul style="list-style-type: none"> <li>– Created and maintain a list of current women in US academic robotics research</li> <li>– Link: <a href="https://us-women-in-robotics-research.github.io">us-women-in-robotics-research.github.io</a></li> </ul>