

Eric C. Deng

CONTACT INFORMATION	2832 Menlo Ave. Los Angeles, CA 90007	denge@usc.edu www.linkedin.com/in/denge/
RESEARCH INTERESTS	Socially Interactive Robotics, Human-Robot Interaction, Artificial Intelligence, Tangible Media, Motion Planning, Knowledge Representation, Product Design, Computational Design	
EDUCATION	University of Southern California , Los Angeles, CA	
	M.S., Product Development Engineering	Fall 2018 (Optionally)
	<ul style="list-style-type: none">• Thesis Topic: <i>Generative Embodiment Design for Interactive Agents (Tentative)</i>• Advisors: Maja J. Matarić, Ph.D	
	B.S., Electrical Engineering <i>Robotics and Control Systems</i>	Fall 2017 (Expected)
	<ul style="list-style-type: none">• Thesis: <i>Minimal Behaviors for Socially Interactive Robots</i>• Advisors: Maja J. Matarić, Ph.D and Gaurav S. Sukhatme, Ph.D	
INDUSTRY EXPERIENCE	Product Development Consultant, VNTANA 3D	8/2017 to Present
	Leading electromechanical and industrial redesign of cutting-edge holographic displays. Designing and prototyping new manufacturable (DFMA), product lines for holographic media platforms.	
	Robotics and Product Engineering Intern, Facebook Inc.	5/2017 to 8/2017
	Led exploration and development for new electromechanical products to be integrated into Facebook's existing and upcoming product suites. Industrial/mechanical design, systems architecture, and market research. <i>Multiple Patent Applications.</i>	
	Fellow, IDEO CoLab	5/2017 to 8/2017
	Designed and prototyped human-centered products, services, and ventures on teams of designers, engineers, and businesspeople with a specialization in interactive agents, consumer hardware design, nonverbal signaling, and robotics.	
	Co-Founder and CEO, Botkins Robotics	5/2016 to 8/2017
	Co-founded personal robotics company focused on blended-reality interaction for open-world play with children. Led business and product design as well as development of mechanical and electrical systems and content. Winners at the USC Maseeh Entrepreneurship Prize Competition and presented at USC Board of Trustees meeting.	
	Robotics and Product Engineering Intern, Facebook Inc.	5/2016 to 8/2016
	Led product development on new robotics-related product and infrastructure tools including designing and building electromechanical systems and integrating prototypes with existing Facebook products and tools. <i>Multiple Patent Applications.</i>	
	Robotics Engineering Intern, Facebook Inc.	5/2015 to 8/2015
	Designed and built electromechanical systems for prototypes of robotics-related technologies with a focus on manufacturability and assembly. Evaluated designs and materials—finite element analysis (FEA) and failure mode effects analysis (FMEA). <i>Multiple Patent Applications.</i>	
	Hardware Engineering Intern, Sandia National Laboratories	7/2013 to 2/2014
	Designed and prototyped embedded systems for a number of confidential projects primarily concerned with remote sensing and closed-loop/real-time control systems.	
RESEARCH EXPERIENCE	Research Assistant and Fellow, Interaction Lab	12/2014 to Present
	Computational, end-to-end design of socially interactive robots. Developing and evaluating model-based approaches for building effective embodiments and gestures	

for socially interactive robots. *Funded by Richardson Research Fellowship and NSF
Advised by Maja J. Matarić, Ph.D*

Research Assistant, *Immersive Audio Laboratory* 8/2017 to Present
Studying relationships of localization errors in 3D space with head-related transfer function uniqueness with implications in sound design principles for immersive content.
Advised by Chris Kyriakakis, Ph.D

Research Engineer, *Computational Physics Laboratory* 4/2014 to 12/2014
Studied the extinction and instability mechanisms of premixed turbulent flames in isotropic flow. Designed novel, jet-mixed combustion chamber in Solidworks and ran simulation-based analysis using ANSYS Fluent.
Advised by Paul D. Ronney, Ph.D

JOURNAL
PUBLICATIONS

1. Elaine Short, **Eric C. Deng**, David Feil-Seifer, and Maja J. Matarić. “Understanding Agency in Interactions Between Children with Autism and Socially Assistive Robots”, *Transactions on Human-Robot Interaction (THRI)*. 2017 (Pre-Print).

REFEREED
PUBLICATIONS

1. **Eric C. Deng** and Maja J. Matarić. “Model-Based Approaches for Attention Acquisition for Human-Robot Interaction”, Refereed paper at 2017 Interaction Design and Children (IDC) Workshop on *Playing Together*. June 2017.
2. **Eric C. Deng** and Maja J. Matarić. “Mime-Inspired Behaviors in Minimal Social Robots.” Refereed paper at 2017 ACM Conference on Human Factors in Computing Systems (CHI) Workshop for *What Can Actors Teach Robots*. May 2017.
3. **Eric C. Deng** and Ross Mead. “Electromagnetic Platform Stabilization for Mobile Robots”, Refereed paper in AAAI Spring Symposium on *Enabling Computing Research in Socially Intelligent Human-Robot Interaction: A Community-Driven Modular Research Platform*, March 2016.

THESIS

1. **Eric C. Deng**. “Minimal Behaviors in Socially Interactive Robots”, Undergraduate Thesis, *University of Southern California, Departments of Computer Science and Electrical Engineering*, May 2017.

JOURNAL
PUBLICATIONS
UNDER REVISION

1. **Eric C. Deng**, Bilge Mutlu, and Maja J. Matarić. “Embodiment in Socially Interactive Robots”, *Foundations and Trends in Robotics*. 2018. *Accepted and Under Final Development*.

SUBMITTED
CONFERENCE
PUBLICATIONS

1. Elaine Short, **Eric C. Deng**, Rhianna Lee, and Maja J. Matarić. “Socially Assistive Robotics for Intergenerational Groups”, *2018 ACM/IEEE international Conference on Human-Robot Interaction (HRI)*. 2018.
2. **Eric C. Deng**. “Object-Based Gesture Generation for Socially Interactive Robots”, 2018 ACM/IEEE International Conference on Human-Robot Interaction (HRI) *Pioneers Workshop*. 2018.
3. **Eric C. Deng** and Maja J. Matarić. “Object-Based Generative Methods for Embodied Gestures in Socially Interactive Robots”, Refereed paper in AAAI Spring Symposium on *UX in Artificial Intelligence*, March 2018.

PAPERS IN
PREPARATION

1. Caitlyn Clabaugh, David Becerra, **Eric C. Deng**, and Maja J Matarić. “Long-term, in-Home Evaluations of Socially Assistive Robotics with Children”, *17th Conference on Autonomous Agents and Multi-Agent Systems. Socially Interactive Agents Track. (AAMAS), 2018.*
2. **Eric C. Deng** and Maja J Matarić. “A Platform-Agnostic Approach for Generating Mime-Inspired Gestures for Interactive Agents”, *17th Conference on Autonomous Agents and Multi-Agent Systems. Socially Interactive Agents Track. (AAMAS), 2018.*
3. **Eric C. Deng** and Maja J Matarić. “Multi-Modal Attention Acquisition Strategies in Human-Robot-Screen Interactions”. *10th International Conference on Automotive User Interfaces and Interactive Vehicular Applications (UIST). ACM, 2018.*
4. **Eric C. Deng**, Konstantinos Tsiakas, and Maja J Matarić. “Reinforcement Learning Methods for Minimal Behavior Personalization in Long-Term Human-Robot Interaction”, *2018 International Conference on Robotics and Automation (ICRA).* 2018.
5. **Eric C. Deng** and Maja J Matarić. “Generative Embodiment Design for Interactive Agents”, Master’s Thesis, *University of Southern California, Departments of Aerospace and Mechanical Engineering and Computer Science.* December 2018.
6. **Eric C. Deng** and Maja J Matarić. “Spatial Attention Inference in Human-Robot-Screen Interactions—A Comparison of Typically-Developing Children and Children with Autism Spectrum Disorder”. *TBD.*
7. **Eric C. Deng**, Paul Chyz, and Chris Kyriakakis. “The Role of HRTF Uniqueness in 3D Localization of Sound Sources”, *TBD.* 2018.

AWARDS

- Stamps Scholar**, *USC and Stamps Family Foundation* 2014
Four-year, full-tuition scholarship at the University of Southern California funded by the Stamps Foundation with an additional \$20,000 enrichment fund. One of five scholars selected in graduating class.
- Richardson Research Fellow**, *USC Viterbi School of Engineering* 2016
Endowed fellowship for engineering research—specifically funded for work related to interactive robotics and natural language generation for autonomous agents. One of eleven scholars selected for inaugural class.
- Undergraduate Research Symposium Winner**, *USC* 2015, 2016
2nd Prize and Honorable Mention winner in the USC Undergraduate Research Symposiums (2016 and 2017) in the Physical Sciences, Math, and Engineering category.
- Honors Colloquium Moderator Award**, *USC Viterbi School of Engineering* 2015
- Boeing Scholarship Recipient**, *USC Viterbi School of Engineering* 2015
- Viterbi Undergraduate Fellow**, *USC Viterbi School of Engineering* 2014
- W.V.T. Rusch Honors Student**, *USC Viterbi School of Engineering* 2014
- Boeing Design Challenge *First Place Winner***, *USC* 2014
- Lockheed Martin National Merit Scholar**, *Lockheed Martin Corporation* 2014

INVITED TALKS

- Teaching Design Thinking using Minimal Robotics** Fall 2017
University of Southern California; *Los Angeles, CA*
- End-to-End Design of Socially Interactive Robots** August 2017
Northwestern Polytechnic University; *Xi’an, China*
- Targeted Design Methods for Socially Assistive Robots** February 2017
California College of Arts (Master’s in Interaction Design); *San Francisco, CA*

Socially Assistive Robots and the Classroom of Tomorrow January 2017
The Growing Place; *Los Angeles, CA*

INVOLVEMENT **President**, *Eta Kappa Nu (HKN), Upsilon Chapter* August 2017 – Present
M.S. Ambassador, *Mechanical Engineering Department* August 2017 – Present
Founding President, *Theta Tau, Kappa Epsilon Chapter* August 2015 – Present
Founding Student Director, *City Fellows Consortium* August 2015 – Present
Viterbi Student Ambassador, *Viterbi School of Engineering* May 2015 – May 2016
Mechanics Team Lead, *USC Formula SAE (SC Racing)* May 2014 – May 2016

SKILLS

Organizational Skills:

- Design for Manufacturing and Assembly (DFMA), Product Management (Hardware and Software), Human-Centered Research and Design (in-person and online), Natively and professionally fluent in English and Mandarin
- Application domain expertise in personalized learning, entertainment, social skill therapy, and special needs populations.

Hardware Skills:

- Solidworks, Keyshot, Embedded-C, Altium, Eagle, ZBrush, ANSYS, Finite Element Analysis and Computational Fluid Dynamics Analysis (FEA/CFD), Clay and Wood Prototyping, NX, AutoCAD Fusion360, Creo

Software Skills:

- C++, ROS, Machine Learning, Python, Unity, Javascript, Adobe Illustrator/Photoshop, Sketch, Matlab, LaTeX

SERVICE

AAAI Awards Judge, *Intel International Science and Engineering Fair* 2017
Invited to be one of 6 guest judge for the Association for the Advancement of Artificial Intelligence (AAAI) Special Awards at the world finals for Intel ISEF, selecting AI-centered projects to be recognized for novel applications and technical contributions.

Reviewer, *International Journal of Social Robotics (IJSR/SORO)* 2017 to Present
Reviewer for IJSR and SORO, journal venues for publications related to social robotics and interactive agents. Specific background in Autism Spectrum Disorder (ASD) applications, robot design, and nonverbal behaviors.

Outreach Coordinator, *Interaction Lab* 12/2015 to Present
Coordinating lab tours and outreach events both on and off-campus. Leading undergraduate student workers in designing and building exciting robotics demos and giving presentations designed to generate interest in STEM through robotics.

Mentor, *Interaction Lab* 06/2016 to Present
Mentoring a combination of undergraduate and masters students, helping them better understand the research fields and state of the art in robotics, teaching robotics concepts and general engineering practices, and reviewing and evaluating work (in the form of code review and discussion sections). Helped mentor 27 undergraduate and 3 masters students to-date.

Service Committee Co-Lead, *Theta Tau-Kappa Epsilon* 8/2015 to 8/2017
Helped source, design, and lead service events for the USC chapter of Theta Tau with a focus on STEM for underrepresented populations in the Los Angeles area.

Workshop Coordinator/Instructor, *Expanding Your Horizons* 11/2010 to 6/2014
Designed and taught workshops to inspire young female students to be interested in the STEM fields with a focus on robotics and hands-on prototyping.