

Behzad Sadrfaridpour

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PROFESSIONAL EXPERIENCES AND APPOINTMENTS SUMMARY

Postdoctoral Fellow , University of Maryland, College Park, MD, USA	10/2018 – Present
Graduate Research Assistant , Clemson University, Clemson, SC, USA	8/2013 – 8/2018
Creative Inquiry Mentor , Clemson University, Clemson, SC, USA	1/2017 – 12/2017
Teaching Fellow , Clemson University, Clemson, SC, USA	5/2016 – 7/2016
Graduate Teaching Assistant , Clemson University, Clemson, SC, USA	8/2013 – 7/2015
Noise Barrier Engineer , Sharif Rotary Industry	5/2012 – 7/2013
Mechanical Engineer Intern , Sanat Pardazan Arash Co.	5/2008 – 9/2008

EDUCATION

Ph.D., Mechanical Engineering , Clemson University, Clemson, SC	8/2013 – 8/2018
Dissertation: Trust-Based Control of Robotic Manipulators in Collaborative Assembly	
M.Sc., Mechanical Engineering , Tarbiat Modares University	9/2008 – 8/2011
Thesis: Designing and Manufacturing Ultrasonic Flowmeters	
B.Sc., Mechanical Engineering , University of Tabriz	9/2003 – 2/2008

TECHNICAL SKILLS

Proficient:	Python, MATLAB (Simulink), Robot Operating System (ROS)
Familiar:	C++, OpenCV, Linux, Git, Adobe Premier
Knowledge:	Robotics, Machine Learning, Control, Motion Planning, Sensor Fusion, Tracking

SELECTED COURSEWORK AND PROFESSIONAL DEVELOPMENT

Motion Planning	Vision Intelligence and Machine Learning	Optimal Control
Adv. Nonlinear Control	Analysis of Tracking Systems	Estimation and Control

SELECTED ACCOMPLISHED PROJECTS

- Size and Frequency Maps of Oysters in the Chesapeake Bay 2019 – Present
 - Integrated a commercial ROV with a GoPro camera for data collection *University of Maryland*
 - Trained an object detector (Mask R-CNN) for oysters with average precision of 0.66
- Improve Tactile Perception and Grasping/Manipulation 2018 – Present
 - Proposed computational tactile flow for biotac sensors *University of Maryland*
 - Demonstrated the tactile flow application in shape and action detection by conducting robotic experiments using Shadow Dexterous Hand and published the results on arXiv
- Trust-Based Framework for Cooperative Manipulation 2017 – 2018
 - Identified human trust in robot in cooperative manipulation *Clemson University*
 - Developed an estimator of human desired motion using Gaussian Process
 - Designed a customized gripper with force sensing capability for Baxter Robot
 - Implemented a trust-based control policy for human-robot collaborative manipulation and published the results as a conference paper
- Trust-Based Framework for Collaboration in Flexible Manufacturing 2015-2017

- Designed a new speed controller for robot manipulators along a given path *Clemson University*
 - Implemented motion planning and speed control for Baxter Robot via a Python ROS node
 - Implemented a Recursive Least Square human intent learning strategy via a C++ ROS node
 - Implemented Model Predictive Control to find an optimal speed of robot considering both efficiency and human factors including by developing a C++ ROS node
 - Implemented an object detection with OpenCV in Python for Baxter gripper camera images
 - Designed human-in-the-loop experimental studies with efficiency and human factor measures resulting in 2 conference papers and journal publication.
5. Trust-Based Framework for Robot Handover in Flexible Manufacturing 2017
- Designed a new trust-based handover motion planner to enhance safety *Clemson University*
 - Implemented the trust-based handover strategy for Baxter Robot via a Python ROS node
6. Teleoperation of Unmanned Aerial Vehicles (UAV) 2013-2015
- Implement a trajectory tracking controller for an AR. Drone 2.0 *Clemson University*
 - Collaborated to design human-in-the-loop studies via multiple objective and human subjective measures resulted in 2 conference papers in American Control Conference (ACC)
7. Modelling Human Trust in Robot in Collaborative Manufacturing 2013-2015
- Developed a neural network speed controller for Baxter robot *Clemson University*
 - Developed a C++ ROS node to track hand position via PhaseSpace motion capture system
 - Identified a model for human trust in robot using autoregressive–moving-average (ARMA)
 - Designed human-in-the-loop studies resulting in 2 conference papers and a book chapter
8. Motion Planning from Triangulation
- Devised, simulated, and wrote a technical report for a motion planning strategy for mapping of a discrete abstraction of a polygonal environment to a continuous vector field (in Python)

SELECTED PUBLICATIONS (3 OF 12)

- J1. B. Sadrfaridpour** and Y. Wang, “Collaborative Assembly in Hybrid Manufacturing Cells: An Integrated Framework for Human-Robot Interaction,” In *IEEE Transactions on Automation Science and Engineering*, vol. 15, no. 3, pages 1178-1192, July 2018.
- J2.** M. Rahman, **B. Sadrfaridpour**, Y. Wang, I. Walker, L. Mears, R. Pak, and S. Remy, “Trust-Triggered Robot-Human Handovers Using Kinematic Redundancy for Collaborative Assembly in Flexible Manufacturing,” *IEEE Transactions on Automation Science and Engineering*, submitted.
- B1. B. Sadrfaridpour**, H. Saeidi, J. Burke, K. Madathil, and Y. Wang, “Modeling and Control of Trust in Human-Robot Collaborative Manufacturing,” *The Intersection of Robust Intelligence (RI) and Trust in Autonomous Systems*, pp. 115-141, Springer, USA, 2016

AWARDS

- 2nd place winner, **Poster Competition** in Graduate Research and Discovery Symposium, College of Engineering, Computing and Applied Sciences, Clemson University, 2017
- Winner of the Mechanical Engineering Department Graduate **Poster Competition**, 2016
- Best Student Paper Award**, Intl. Conf. on Automation Science and Engineering (CASE), 2016
- NSF Doctoral Consortium Travel Award** for IEEE CASE conference, 2016