# Hemanth Manjunatha

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CONTACT INFORMATION

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EDUCATION

**State University of New York at Buffalo** 2016 - 2020 (Expected)
*M.S + Ph.D. Candidate*, Mechanical Engineering, HILS LAB @ UB
Human Robot Interaction | Reinforcement Learning | Brain computer interfaces | Sensor Fusion | Deep Learning

GPA – 3.835/4.0 (Fall 2015-Spring 2018)

**Courses**: Deep Learning, Pattern recognition, Robotic Algorithms (Using ROS), Math methods in robotics, and Optimization in Engineering Design

CURRENT RESEARCH

- Hybrid Reinforcement learning for Human Swarm Interaction under Dr. Ehsan T Esfahani, Dr. Souma Chowdhury, and Dr. Karthik Dantu, University at Buffalo.
- Human intent recognition for Human-Robot Interaction under Dr. Ehsan T Esfahani, University at Buffalo.
- Operator's Cognitive State classification using Physiological Signals in a Simulated exploration task with multiple robots under Dr. Ehsan T Esfahani, University at Buffalo.

RESEARCH EXPERIENCE

- Student researcher at Sustainable Manufacturing and Advanced Robotic Technologies (SMART) center at University at Buffalo.
- Object recognition and pose estimation using Microsoft Hololens under Dr. Karthik Dantu, University at Buffalo.
- Implemented a Deep convolution neural network for establishing handwriting individuality under Dr. Sargur N. Srihari, University at Buffalo.
- Deep convolution neural network for emotion recognition using EEG signals under Dr. Ehsan T Esfahani, University at Buffalo.
- Implemented a neural network for hand writing recognition using Rubine features under Dr. Ehsan T Esfahani, University at Buffalo.
- Kinematic analysis of 4RP manipulator. Developed a GUI in MATLAB to implement the analysis under Dr. Venkat Krovi, University at Buffalo.

## BOOK CHAPTER

- Manjunata, H., and Esfahani, ET., "Application of Reinforcement and Deep Learning Techniques in Brain Machine Interfaces." Advances in Motor Neuroprostheses, Ed. by R.Vinjamuri, Springer (Invited Contribution)

## PUBLICATIONS UNDER REVIEW

- Deep Transfer Learning for Motor Control Difficulty Classification in Physical Human-Robot Interaction Using Electromyography. Manjunatha Hemanth, Jujjavarapu Sri Sadhan, Esfahani Ehsan
- Optimal Control of Variable Stiffness End-Effector for Hammering Task. Manjunatha Hemanth, Jujjavarapu Sri Sadhan, Esfahani Ehsan
- Effect of Haptic Assistance Strategy on Mental Engagement in Fine Motor Tasks. Manjunatha Hemanth, Pareek Shrey, Memar Amir, Esfahani Ehsan, and Kesavadas Thenkurussi
- Classification of Reaction Time in Simulated Multiple Robot Tele-Exploration. Manjunatha Hemanth, Memar H. Amir, and Esfahani Ehsan

## PUBLICATIONS

- Pareek Shrey, Manjunatha Hemanth, Keshavadas T, Esfahani Ehsan MyoTrack: Real-time Estimation of Subject Participation in Robotic Rehabilitation Using sEMG and IMU. IEEE Access 2019.
- Manjunatha Hemanth, Memar Amir, Esfahani Ehsan Classification of Task Type and Reaction Time of Operator in Simulated Multiple Robot Tele-Exploration. Frontiers in Human Neuroscience, doi:10.3389/conf.fnhum.2018.227.00015.
- Manjunatha H, Huang J, Zhang B, Rai R. A Sequential Sampling Algorithm for Multi-Stage Static Coverage Problems. ASME. International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, Volume 2B: 42nd Design Automation Conference ():V02BT03A029. doi:10.1115/DETC2016-60305. http://proceedings.asmedigitalcollection.asme.org/proceeding.aspx?articleid=2591656
- Hemanth M, Avinash Kumar K M, Aashish V Bhat, Bhagyashree Kulkarni, Dr. T N Shridhar, Active flow control using synthetic jets and Neural Networks, Proceedings of 16th AeSI CFD Symposium, Aug 11-12, 2014, National Aerospace Laboratories, Bangalore, India.
http://www.nal.res.in/CFDsympo16/FULL%20PAPERS-AeSICFD16/CP9.pdf

## TEACHING EXPERIENCE

**Teaching assistant**
*Served as a teaching assistant for Manufacturing automation course*
- Conducted lab session for a class of 60 students.
- Taught robotics, Matlab, V-REP, and Manufacturing automation concepts.

**The National Institute of Engineering, Mysore, India**
*Resource Person*
- Conducted *Application of Neural networks in Mechanical Engineering* course for third year students.

## PROJECT EXPERIENCE

**National Aerospace laboratory** in Bangalore, Karnataka, India Jan-May 2014
*Project student*
- Completed the project Active flow control using synthetic jets and Neural Networks in MATLAB.
- Designed a controller for active flow control using Neural networks by writing an in-house code.

**Gas Turbine Research Establishment** in Karnataka, India Jan-February 2013
*Project student*
- Conceived an Inverse design process to design an aerofoil using Neural Networks in MATLAB.
- The indigenous code developed brought the design time to 10-15 minutes.

## TECHNICAL SKILLS

**Github:** https://github.com/HemuManju

**Programming Languages:** Python, Matlab, R, ROS (Beginner level), C, and Julia

**Libraries:** Pytorch, MNE-python, Tensorflow, NumPy , Pandas, Sklearn, PIL, and LaTeX.

**Computer Applications:** Autodesk Inventor, COMSOL, and Solidworks.