Sunny Amatya

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Education:

- **Arizona State University (ASU)**
  - PhD in Systems Engineering — *09/2018 - present*
- **European Masters for Advanced Robotics (EMARO+)**
  - École Centrale de Nantes, France (first year) — *09/2016 - 07/2017*
  - Università degli studi di Genova, Italy (second year) — *09/2017 - 09-2018*
- **Asian Institute of Technology (AIT)**
  - B.Sc.E. Mechatronics Engineering (3.81/4 CGPA) — *09/2011 - 05/2015*

Publications:

Sunny Amatya, Mukesh Ghimire, Yi Ren, Zhe Xu, and Wenong Zhang *"When Shall I Estimate Your Intent? Costs and Benefits of Intent Inference in Multi-Agent Interactions"* in American Control Conference (ACC), 2022 (Accepted)

Yiwei Wang, Pallavi Shintre, **Sunny Amatya**, and Wenlong Zhang *"Bounded Rational Game-theoretical Modeling of Human Cooperation under Incomplete Information"* in Mechatronics. 2021 (Submitted)

Yi Chen, Lei Zhang, Tanner Merry, **Sunny Amatya**, Wenlong Zhang, Yi Ren. *"When Shall I Be Empathetic? The Utility of Empathetic Parameter Estimation in Multi-Agent Interactions"* in IEEE International Conference of Robotics and Automation (ICRA), 2021

Pham H. Nguyen, Zhi Qiao, Sam Seidel, **Sunny Amatya**, Imran I. B. Mohd, and Wenlong Zhang *"Towards an Untethered Knit Fabric Soft Continuum Robotic Module with Embedded Fabric Sensing"* in the IEEE International Conference of Soft Robotics (RoboSoft), 2020

Sunny Amatya, Seyed Mostafa Rezayat Sorkhabadi, and Wenlong Zhang *"Human Learning and Coordination in Lower-limb Physical Interactions"* in American Control Conference (ACC), 2020

Antony Thomas, **Sunny Amatya**, Fulvio Mastrogiovanni and Marco Baglietto. *"Task-assisted Motion Planning in Belief Space"* in Italian Conference on Robotics and Intelligent Machines (I-RIM), 2019

Sunny Amatya, Amir Salimi Lafmejani, Souvik Poddar, Saivimal Sridar, Thomas Sugar, Panagiotis Polygerinos *"Design, Development, and Control of a Fabric-Based, Soft Ankle Module to Mimic Human Ankle Stiffness"* in International Conference on Rehabilitation Robotics (ICORR), 2019

Pham H. Nguyen, Saivimal Sridar, **Sunny Amatya**, Carly M. Thalman, Panagiotis Polygerinos. *"Fabric Soft Grippers Grippers Capable of Selective Distributed Bending for Assistance of Daily Living Tasks"* in IEEE International Conference of Soft Robotics (RoboSoft), 2019

Antony Thomas, **Sunny Amatya**, Fulvio Mastrogiovanni, and Marco Baglietto.*"Towards Perception Aware Task and Motion Planning"* in AAAI 2018 Fall Symposium, 2018

Antony Thomas, **Sunny Amatya**, Fulvio Mastrogiovanni and Marco Baglietto. *"Task-Motion Planning in Belief Space"* in RSS Workshop on Exhibition and Benchmarking of Task and Motion Planners, 2018

Sunny Amatya and Somrak Petchartee. *"Real time kinect based robotic arm manipulation with five degrees of freedom."* in IEEE Asian Conference on Defence Technology (ACDT), 2015

Projects and Experience:

Graduate Researcher **- Robotics and Intelligent Systems Labratory, ASU** *05/2019- Present*

Intermittent Empathetic Intent Inference Algorithm for Autonomous Vehicles

- Implementation of Reinforcement Learning Algorithm to test the cost and benefits of calculation of equilibrium parameters in incomplete information dynamic games.
- Use of Meta-Learning for generalization of algorithm to different driving scenarios
- Transfer learning as an approach to generate a generalizable intelligent model

Identification of Driving Primitives in Multi-Vehicle Interaction *10/2020- 05/2021*

- Implementation of driving primitives in round-about scenario based on INTERACTION dataset.
- Development of Monte Carlo Method for a finite horizon nash equilibrium solution for driving primitives

Parameter Estimation of Empathetic Intent Inference Algorithm *05/2020- 10/2020*

- Implementation of lane changing scenario for generation of Hamilton-Jacobi-Bellman Solution for multi-agent interaction.

Physical Human-Human Interaction for Quantifying Human Learning *05/2019- 05/2020*

- Implementation and testing of Dynamic Movement Primitives for learning human walking in a three-legged walking scenario.
- Quantifying human behavior using Bounded Rationality in upper limb pHRI

Graduate Researcher **- Bio-Insipired Robotics Labratory, ASU** *09/2018- 05/2019*

Anthropomorphic Robotic Ankle Prosthesis with Programmable Materials

- Fabrication and testing of fabric-based soft robotic ankle mimicking human torque during walking

Graduate Researcher **- DIBRIS, UNIGE** *12/2017- 09/2018*

Goal-Based Cooperation and Reasoning for Heterogeneous Robots

- High-level planning using predicate logic for controlling aerial and mobile robots
- Hybrid planning for cooperative task and motion planning using state of the art PDDL+ planner
- Framework development in ROS using C++

Research Assistant **- Vision and Graphics Lab, AIT** *10/2015 – 07/2016*

- Completed project on HOG detection and tracking model for Low Frame Rate Videos.
- Worked on Kinect sensor for detection and tracking.
- Worked with image processing for pattern recognition.
- Conducted research on supervised learning methods such as SVM, pattern recognition, feature-keypoint detection, and mathematical modeling

Bachelor's Thesis **- AIT** *01/2015 – 05/2015*

- Thesis titled 'Actuation of Scorbot ER III using Hand and Finger Gestures.
- Used Visual C++ with Kinect Libfreenect Library and Robotics Toolbox in Matlab

***Industrial Internship* - Head Stack Assembly, Western Digital** *05/2014–07/2014*

- Worked on automatic displacement machine to test headstack in harddrives

***Research Internship* - IDEAS lab, Rajamangala University of Technology** *05/2013–08/2013*

- Worked in a graphical interface for model platform screen door and model train using Visual C

Awards

• RSS inclusion 2020

• Block Grant University Graduate Fellowship by The Polytechnic School, ASU for Spring 2020

• EMARO+ scholarship for 2016-2018

• AIT fellowship on merit basis for 2012, 2013 and 2014 with 6 dean's list.

• Top 10 in TAMECH (Thai Ariel Mission Engineering Challenge), representing AIT

• Awarded scholarship in High School for active participation in co-curricular activities

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Programming language and proficiencies:

• **Language**: Python, C++, MATLAB, Java, Visual Basic, Val II/Val + and C

• **Hardware**: ARM Cortex, Raspberry Pi, Freescale Microcontroller, Teensy,

• **Other**: ROS, OpenCV, OpenAI, Simulink, CATIA Siemens, Solidworks, CAD-CAM

Reference:

Dr. Wenlong Zhang

Associate Professor

Principal Investigator, Robotics and Intelligent System Laboratory (RISE Lab)

Arizona State University

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