ANERI D. MUNI
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EDUCATION

ETH | Zurich, Switzerland *May 2021*
Major: MSc. in Robotics, Systems and Control
- **Machine Learning Summer School,** Tübingen, July 2020
- **Robotics Summer School**: 'Real World, Real Environments', July 2019

GEORGIA INSTITUTE OF TECHNOLOGY | Atlanta, Georgia *May 2018*
Major: Bachelor of Science in Electrical Engineering *GPA: 3.56*
Minor: Robotics
- Graduated with Highest Honors
- **Study Abroad Experience**: Georgia Tech Lorraine (France), Summer 2014

EXPERIENCE

INSTITUTE FOR DYNAMIC SYSTEMS AND CONTROL | ETH Zurich
Safe Model Based Reinforcement Learning *Sept. 2019 – Dec. 2019*
- Safe learning based on Thompson sampling with open-loop model predictive control
- Model-based RL with scenario-based optimization arguments to obtain safety-certified algorithms

AUTONOMOUS SYSTEMS LAB | ETH Zurich
Visiting Student Researcher *June 2017 – August 2017*
- Programmed ABB's YuMi robot to rebuild a block stack after scanning it.
- Developed pick-place routine using MoveIt! and object-detection routine using PCL and ASUS PrimeSense sensor.

GEORGIA TECH RESEARCH INSTITUTE | Atlanta, Georgia
Robotics and Image Processing *August 2015 – Dec. 2015*
- Programmed an agricultural robot to maneuver autonomously in poultry houses.
- Developed obstacle avoidance algorithms using data from Xbox Kinect.
- Implemented path finding algorithm using pre-defined map of chicken houses.
- Designed user friendly Windows GUIs in C# to run a pedestrian tracking software. *May 2016 – August 2016*
- Processed data and accessed results for Georgia Department of Transport using MySQL.

SCHOOL OF MATHEMATICS | Atlanta, Georgia
Teaching Assistant for Differential Equations *Jan. 2016 – May 2016*
- Tutored a class of 30 students by holding recitations twice a week.
- Held office hours, solved difficulties and graded exams and homework..

PROJECTS

PLANNING UNDER UNCERTAINTY | Zurich *Sept. 2019 – Nov. 2019*
Autonomous Mobility on Demand (Duckietown), ETH
- Goal: To anticipate "future" obstacles in unseen regions and modify duckiebot's behavior to maximize its safety
- Designed a probabilistic model to represent uncertainty in environment and change duckiebot's velocity profile corresponding to this uncertainty of "shadow" regions

DYNAMIC SCENE RECONSTRUCTION | Atlanta, Georgia *Jan. 2017 – May 2018*
Georgia Tech Research Institute
- Conducted literature review for 3D reconstruction and studied algorithms like *KinectFusion* and *DynamicFusion.*
- Goal: To implement algorithms for tracking and reconstruction of dynamic, non-rigid scenes in real time.

QUADRUPED ROBOT | Atlanta, Georgia *August 2016 –Dec. 2016*
IVALabs, Georgia Tech
- Programmed a quadruped that emulates the locomotion gaits of quadrupeds found in nature.
- Designed 3D model of quadruped with an actuated spine using Autodesk Inventor.

GT-MAB - AUTONOMOUS BLIMPS | Atlanta, Georgia   *May 2015 – July 2015*
Georgia Tech Systems Research Lab
- Performed system identification and developed PID controllers to control 3D motion of a robotic helium blimp.
- Acquired light intensity data to map air current flow patterns.
- **Nano Blimp –** developed a hardware/software for communication for smaller version of blimp.   *Jan. 2016 – April 2016*

AWARDS

- Best Oral Presentation, 3rd position, Undergraduate Research Symposium   *Spring, 2018*
- Best Overall Design Award, *MakeHarvard* Hackathon   *Spring, 2018*
- President's Undergraduate Research Award   *Spring 2018, Spring 2016, Summer 2015*
- ThinkSwiss Research Scholarship   *Summer 2017*
- James G. and Mary G. Wohlford Co-op Scholarship   *Spring 2017*
- IEEE Control System Society Video Contest, 3rd position   *Summer 2015*

POSTER/PRESENTATIONS

A.D. Muni, K. Wabersich, M. Zeilinger, *Learning-Based Control for Constrained Systems using Thompson Sampling and Scenario Optimization*. 2020 Machine Learning Summer School (MLSS), Tübingen.
Available: https://www.youtube.com/watch?v=ToeYuLxbwX0&t.

PUBLICATIONS

- Q. Tao, M. King-Smith, **A.D. Muni**, V. Mishra, S. Cho, J.P. Varnell, F. Zhang, *Control Theory – Autonomous Blimp*. 2015 [Online]. Available: https://youtu.be/5M-V4GOFNDA.

- S. Cho, V. Mishra, Q. Tao, P. Varnell, M. King-Smith, **A. Muni**, W. Smallwood, F. Zhang. *Autopilot Design for a Class of Miniature Autonomous Blimps*. 2017 IEEE Conference on Control Technology and Applications. Pages: 841 - 846.

- C. T Usher, W. D Daley, B. P Joffe and **A. Muni**. *Robotics for Poultry House Management*. 2017 ASABE Annual International Meeting. 1701103.(doi:10.13031/aim.201701103).

SKILLS/INTERESTS

Programming: Python, MATLAB, C++, Java, RobotC
Platforms: Linux, Robotic Operating System (ROS)
Hardware: ARM Mbed microcontroller, Arduino, Raspberry Pi, LaunchPad, FPGAs, oscilloscope, logic analyzer
Software: GitHub, MathCAD, Multisim, LTSpice, Autodesk Inventor, Quartus II, NI LabVIEW, OpenCV, PCL, MoveIt!
Communication: Design proposals, technical reports, instruction manuals, presentations (large and small audiences)
Languages: English (fluent), Hindi (native), Gujarati (fluent)
Volunteer: Volunteered as a tutor for underprivileged students from K-5th grade in Atlanta's communities.

RELEVANT COURSES

Systems and Control:

- Masters: Model Predictive Control, Control Systems 2, Nonlinear Systems Control, Introduction to Machine Learning, Autonomous Mobile Robots, Probabilistic Artificial Intelligence, System Identification, Dynamic Programming and Optimal Control, Image Analysis and Computer Vision, Robot Dynamics, Linear Systems Theory, Autonomous Mobility on Demand
- Bachelors: Introduction to Automation and Robotics, Feedback Control, Control System Design, Signals and Systems, Embedded Systems

Computer Science: Data structures and Algorithms, Intro. to Object-Oriented Programming, Engineering Software Design

Core ECE: Computer Communication, Digital Signal Processing, Circuit Analyses, Microelectronics, Electromagnetism, Electrical Energy Systems.