Prashin Sharma

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Summary

- Robotics Engineer with 7+ years experience.
- Expertise in modeling and designing mechanical systems, aerial/ground robots.
- Skilled in Computer Aided Designing, analysis of components and machining.
- Effectual leader, offering robust qualifications in coordinating diverse teams, continuous process improvement, field management and human relations.

Education

University of Michigan — **Ann Arbor, MI**
PhD Candidate, Robotics Institute — Jan 2017 - Dec 2021
Thesis : Health informed autonomous decision-making for emergency landing of drones

PHM Society Short Course : Analytics for PHM — Online, Nov 2020

Massachusetts Institute of Technology — **Boston, MA**
Professional Education - Short Course — Jun 2015
Rapid Robotics : Autonomous System with Open Source Software

Carnegie Mellon University, — **Pittsburgh, PA**
Master of Science, Mechanical Engineering — May 2010

PCE, Mumbai University — **Mumbai, India**
Bachelor of Engineering, Mechanical Engineering — May 2008

Current Research Experience

University of Michigan — **Ann Arbor, MI**
Graduate Student Research Assistant — Jan 2017 - Present

- Built, equipped and tested multi-rotor platforms to analyze their aerodynamic performance empirically by conducting wind tunnel and outdoor autonomous flight tests.
- Programmed and flight tested control software in C on an embedded system.
- Built Li-ion battery testing equipment to identify battery model parameters. This battery model was used in simulation and developing a MDP framework for battery reconfiguration in a series-parallel battery pack on UAS.
- Collaborating with Virginia Tech on a research project to determine sensitivity of open loop wind sensing for different rotor configurations of hexacopter.
- Contributed towards development of an emergency landing client for drones, on a NSF funded project in collaboration with University of Iowa and Iowa State University.
- Current research is on prognosis informed optimal decisions for executing emergency landing.

Relevant Publications

- **Prashin Sharma**, Ella M. Atkins, "Prognostics Informed Battery Reconfiguration in a Multi-Battery Small UAS Energy System", ICUAS Conference 2021 (Accepted).
- Juan Paredes, **Prashin Sharma**, Brian Ha, Manuel Lanchares, Ella Atkins and Illya Kolmanovsky, "Development, Implementation, and Experimental Outdoor Evaluation of Quadcopter Controllers for Computationally Limited Embedded Systems", Annual Reviews in Control, 2021.
- **Prashin Sharma**, Ella M. Atkins, "Prognostics Based Decision Making for Safe Autonomous Flight", Doctoral Symposium PHM Conference 2020.
- **Prashin Sharma**, Ella M. Atkins, "Experimental Investigation of Tractor and Pusher Hexacopter Performance", AIAA Journal of Aircraft, 2019.
- **Prashin Sharma,** Ella M. Atkins, "An Experimental Investigation of Tractor and Pusher Hexacopter Performance", Atmospheric Flight Mechanics Conference, AIAA Aviation 2018 (*Best Student Paper Award)*.

Relevant Courses

Model Predictive Control	Non Linear Systems	System Identification	Optimal Control
AI Foundations	Rotary Wing Vehicles	Adaptive Control	

Skills

Computer : C/C++, MATLAB, Python, Word, Excel
Certifications : Applications of AI for predictive Maintenance, NVIDIA DLI, 2020
Applications of AI for Anomaly Detection, NVIDIA DLI, 2020
Languages : Proficient in English, Hindi

Work Experience

Hindustan Security Force — **Mumbai, India**
Managing Director — Sept 2013 - Dec 2016

- Overseeing security technology governance and associated risk management.
- Formulation and implementation of industry-leading security programs.
- Created strategic roadmap for the full lifecycle of new and existing solutions.
- Delivered competitive research and analysis to position the company for growth.
- Lead the structuring company policies and streamlined operations by developing Quality Management Systems resulting in ISO 9001 certification.
- Trained, coached and mentored staff towards process improvement for operational excellence.
- Managed strategic planning and business relationships and customer loyalty program.
- Implemented innovative programs to reduce attrition rate and increase employee loyalty.

AdvantechUS Inc. — **Pittsburgh, PA**
Mechatronic Engineer — May 2010 - Aug 2013

- Played a key role in developing, testing and commissioning an inline vacuum coating system using e-beam deposition technique.
- Implemented event-based controller for performing system tasks, such as mask alignment with a substrate, trolley load/unload/transfer and mask exchange in the inline system.
- Responsible for tuning and testing of the high precision alignment stage delivering sub-micron accuracy.
- Developed GUI in VB.Net for controlling welding robot and multi-axis alignment stage.
- Interfacing and programming of controllers to perform tasks at system level.
- Design modification to eliminate system malfunction and failure.
- Interfaced with process experts, vendors and assembly technicians to realize process objectives.
- Developed and executed validation methods to assure results have been accomplished.

Teaching Experience

University of Michigan — **Ann Arbor, MI**
Graduate Student Instructor — Jan 2019 - May 2019

Course - Experimental Unmanned Aircraft System, University of Michigan

- Assisted lecturers in designing course material and design of experiments.
- Guided students through lab experiments and helped them debug flight software on an embedded system written in C.

Journal Publications

- **Prashin Sharma** and Ella Atkins, "Multicopter Aerodynamics and thrust characterization", Journal of Visual Experiments, 2019.
- **Prashin Sharma**, **"**Shape Memory Alloy Actuator for Bio-medical application*"* Vol. 6 - Issue 2 February - 2016, International Journal of Engineering Research and Applications.

Conference Publications

- **Prashin Sharma**, Cosme A. Ochoa, and Ella M. Atkins, "Sensor Constrained Flight Envelope for Urban Air Mobility", AIAA Scitech 2019 Forum.
- **Prashin Sharma**, Iacopo Gentilini and Kenji Shimada, "Optimizing path for kinematically redundant robotic inspection system using Obstacle Based Probabilistic Roadmap and Genetic Algorithm", IEEE TENCON 2016 Conference.

Other Publications

- Ambrose Thomas, Poohsan Tamura, Blake Brocato, Brian Bucci, Jeff Conrad, John Shelapinsky, **Prashin Sharma**, Scott Lauer, and Whit Little. "46.2: Invited Paper: Micron−Patterned Deposition through Shadow masks with high precision alignment for OLED and e−Paper applications." SID Symposium Digest of Technical Papers, 44: 637-639.
- **Prashin Sharma**, "Modern era security threats**",** Vol. 66- Issue 15, January - April 2016, World Association of Detectives, Beyond Global Newsletter33.

Achievements

- 1st Place, Into the Dataverse Hackathon organized by National Security Innovation Network, to develop AI enabling user interface to capture structured and unstructured maintenance data — 2019
- People's Choice award winner in Scientific Visualization Competition at Engineering Graduate Student Symposium, University Of Michigan — 2018
- Best Student Paper at AIAA Aviation Forum in Atmospheric Flight Mechanics category — 2018

Volunteer Work

- Drones and their application webinar at Vision Engineering Fair, 2020.
- E-VTOL Flight Test Committee Council Member.
- FAA Safety Team representative.
- Volunteered for Lego Mindstorm Activity 2019, organized by GradSWE for Girl's Scout.
- Invited as a reviewer for IEEE Transactions on Instrumentation and Measurement.
- Invited as a reviewer for AIAA Journal of Aircraft, Journal of Aerospace Information Systems.
- Invited as a reviewer for IEEE TENCON 2016 conference.