

Education

Stony Brook University

Ph.D., Mechanical (Concentration: Design and Robotics, Minor: Applied Mathematics), GPA 3.95

Stony Brook, NY

Aug. 2015 – Present

- **Relevant Courses:** Robotics, Advanced Dynamics, Vibration and Control, Kinematic Analysis and Synthesis, Applied Stress Analysis, Product Design Optimization, Geometric Modeling, Analysis of Algorithms

Udacity, School of Autonomous Systems

Self Driving Car Engineer Nanodegree

Mountain View, CA

Mar. 2019 – Present

- **Relevant Areas:** Computer Vision, Deep Learning, Sensor Fusion, Localization, Planning, Control, System Integration

Experience

Stony Brook University

Research Assistant

Stony Brook, NY

May 2017 – Present

- Developing a Computational Framework for Data-Driven Mechanism Design Innovation supported by \$450K [NSF grant](#).
- Creating [MotionGen](#) a web-based mechanism design framework. Uses MEAN (MongoDB, Express.js, Angular.js, Node.js) stack to create a RESTful web service based on MVC architecture. iOS and Android app created using Apache Cordova framework.
- Designing algorithms for simulation and synthesis of Planar, Spherical and Spatial single-degree-of-freedom Robotic systems resulting in publications in journals by American Society of Mechanical Engineers.
- In-charge of Computer-Aided Design and Innovation Lab and collaborating with a research group of 10+ graduate students.

Teaching Assistant

Aug 2016 – Apr 2017

- Developed [SnappyXO](#), a laser-cut design-driven robotics platform which enables designing mechanisms, structures, and robots.
- Advised 250+ undergraduate students in MEC101-Freshman Design Innovation and MEC 102-Engineering Computing.
- Mentored students for their Robot Design projects which gained recognition from the Office of President at university.

Indian Institute of Information Technology

Junior Research Fellow

Jabalpur, India

May 2014 – May 2015

- Led a \$70k+ research project funded by the Science and Engineering Research Board titled “Development of Additive-Subtractive Integrated Rapid Prototyping System for Improved Part Quality”.
- Spearheaded design and manufacturing teams to create a new hybrid 3D printing process using Pellet based Screw Extruder with CNC machines
- Developed Toolpath Planning strategies to manufacture CAD models using Hybrid Manufacturing techniques.

Relevant Projects

Fracture test analysis for compact tension specimen

Feb 2017 – May 2017

- Finite element analysis of a fracture specimen to predict and validate deformations at the crack tip using Abacus.

Conceptual Design

Aug 2015 – May 2016

- Conceptual design of an Ergonomic Nutcracker and Stone Crusher.
- Formulation of product design specification and criteria and generation of the best possible product concept.

Quality Improvement of Aircraft Wing Assembly

Aug 2015 – Nov 2015

- Identifying and correcting the root cause for high rejection rate of final assembly using Pareto Charts, Cause and Effect Diagrams, Control Charts and Histograms.

Mold Design and Manufacturing

May 2012 – Nov 2012

- Designed and manufactured molds for irrigation industry products for Injection Molding Process.
- Flow Analysis results were used to optimize design and a Pricing Strategy was developed for industry.

Technical Proficiency

- **Languages :** Python, Javascript, C++, MATLAB, Mathematica
- **CAD softwares :** Solidworks, Autodesk Inventor, PTC Creo, CATIA, Ansys (CFD and Mechanical), Autodesk AutoCAD, Autodesk Moldflow, FeatureCAM, MSC-Adams, ZWCAD, Altair HyperMesh, Altair OptiStruct, Materialize Magics, Materialize Mimics, CNC G-M Code, Minitab
- **Tools & Technologies :** Keras, Tensorflow, OpenCV, HTML, CSS, Canvas, Node.js, Express.js, Redis, Apache Cordova, OpenGL, Jupyter, Anaconda, Git, npm, MongoDB

Selected Publications

- Sharma S., Purwar A., Ge Q.J.; **A Motion Synthesis Approach to Solving Alt-Burmester Problem by Exploiting Fourier Descriptor Relationship Between Path and Orientation.**, ASME J. Mechanisms Robotics; doi:10.1115/1.4042054
- Sharma S., Purwar A., Ge Q.J.; **An Optimal Parametrization Scheme for Path Generation Using Fourier Descriptors for Four-Bar Mechanism Synthesis.**, ASME J. Computing and Information Science in Engineering; doi:10.1115/1.4041566