Krutarth Shah

Cornell University
College of Engineering

Website : krutarthbshah.com
LinkedIn: LinkedIn-Krutarth
Email Id : krutarthbshah@gmail.com, ks2277@cornell.edu
Mobile No.: 631-681-5762
Address: 7-D, Gun Hill Residence, 210 Lake St, Ithaca, NY 14850

EDUCATION

Qualifications	Name of University / College / Institute / Board	Year of Passing	GPA
M.Eng (**Systems Engineering**)	Cornell University,	2018	3.85/4
B. Tech. (**Mechanical Engineering**.)	Navrachana University	2016	3.96/4 (Class Rank-3/70)

SOFTWARES:

Autodesk Fusion 360, Python, C, C++, Arduino, ERP(SAP), JMP, Advanced Excel, Monte Carlo Simulation, Discrete Event Simulation, SYSML, CNC codes.

WORK EXPERIENCE:

- **Transcend Robotics | New product development intern | Silicon Valley, CA**

  Home Robot: My project included conceptualization, *use case selection, design ideation, product design, project management timeline creation, BOM for prototyping, go to market strategy, customer value proposition* and *market potential* for the company's future product for home robotics market segment.

  Level Head: It is a most economical single axis self-balancing platform for the ZED stereo cameras and payloads. I entirely owned level Head project from: *Idea generation – Designing – Prototyping – Manufacturing - Supply chain - Business strategy and Market valuation, complete product life cycle.*

  Provisional patent: The invention is a gear mechanism to achieve Independent Bi-directional Variable Speed Multiple Wheel Control with One Motor for Mobile Robots.

- **Organics Robotics Lab (ORL) | Graduate researcher | Cornell University**

  Pursued a research under Professor Robert Shepherd to develop an **Intelligent Tendon Driven Soft Robotic Hand** which can sense, touch, feel and measure force from different objects like a human hand. Undisclosed project till the time of publication. It has applications in Robotics, Exo-skeleton and Prosthetics.

  We used *Fusion-360, time of flight sensors, wave guides, optics, silicon rubbers, Arduino, motors, 3-D printers, lithography* to develop the robotic hand.

- **Jyoti LTD | Engineering Intern | Navrachana university**

  The Jyoti Group of Companies of industrial units involved in manufacturing and marketing a wide range of electrical and hydraulic engineering equipment.

  Created designs on CREO software, performed scheduling of manufacturing operations, learned about advanced manufacturing processes carried through automation, Vertical and horizontal CNC, Lathe, Milling and Drilling. Learned about the various quality control tools and process carried out after the assembly.

ENTREPRENUERIAL PROJECTS

- **Automatic Weight Changing Exercise Machine with Feedback Control | Cornell University|12 Months**

  Designing and developing an Automatic Weight Changing Exercise Machine with Feedback Control for better strength, high safety and power training by Automatic weight change, incrementing weights in small loads, providing user weight lifting capability.

  Used Product design and system tools like *Use cases, Customer Affinity Process, Activity Diagram, Analytical Hierarchy Diagram, QFD, Flow of thoughts*. After that we used Cading and 3-D printing to carry out the iterations. Finally manufactured the prototype. Also developed the *business model using Business Canvas model, Bass model forecasting, Saw tooth analysis, market size, Net Value worth.*

  • *Submitted a **Provisional Patent Application***

- **Autonomous Braking and Alert System for Two-wheelers | Navrachana University| 12 months**

  Designed the new braking system using cam and motor with analysis and validation in ANSYS. Used various advanced manufacturing techniques and processes (*CNC, Water Jet Cutting, Lathe, Milling, Grinding, Wire cut EDM*) to achieve the desired manufacturability.

  Identified the right sensors (RADAR), developed Logic (Input, Output and Decision module) using MATLAB-SIMULINK, and optimized the deceleration value for various speed using *Monte-Carlo simulation*. Also developed the program using *C++* for deriving pressure in the hydraulic line for various decelerations. *Tecnomatix: Siemens Software* was used to validate the system using values obtained from above software's.

RESEARCH EXPERIENCE:

- **WHEST~ Waste Heat Recovery System for Two Wheelers | Navrachana University| 6 Months**

  Completed Design and Manufacturing project on Waste heat recovery system from the exhaust of two wheelers. Then to use that waste heat (Vaporized Water) to increase the vehicle fuel efficiency and partially replacing petrol with hydrogen as fuel by performing electrolysis. Used *Milling, Drilling, Lathe, CNC* machines for manufacturing the attachment of heat recovery system

- **PATENT- "parallel light beam generator." | Navrachana University| Published: December - 2015**

  Designed a Parallel Light Beam Generator based on fundamental laws of physics of reflection and refraction of light between reflective surfaces. It has applications in nuclear, communications, machining processes, bio-medical operations and solar applications.

PROJECTS

- **AMAZON: Supply Chain for Drone Delivery System | Cornell University | Current**

  Completed a Supply Chain research on Drone Delivery system –AMAZON. The research findings were:
  - Supply chain strategy & design: Initial target market, Drone distribution center location, demand and supply uncertainty matrix, Regulation, Technical Specs.
  - Cost benefit analysis: No. of deliveries by drone vs Courier, Drone fleet size optimization (Discrete Event Simulation), Profit and Revenue, drone deployment etc.

  Interviewed- *Nick De Angelis, Amazon Senior Manager.*

- **SIX SIGMA - Black Belt Certificate Project | Cornell University | 5 months**
  Proposed a solution to Cornell Warehouse Stakeholders based on DMAIC methodology which could optimize the cost by 33% with equal workload distribution for delay in cloth folding process. A space optimization problem using statistical tools such as Quality Control charts and Linear Programing-Operations Management technique.

- **Simulation, Optimization, Reliability Analysis for Air Traffic Control (USA) | Cornell University**
  This project focuses on different aspects of air transportation. The first part is on building a discrete-event simulation model to assess the implications of different air traffic control policies. The second part is on carrying out a reliability analysis for the aircraft landing process. The third part is on building an optimization model for cargo transportation.

- **Designed a Product "Product Identifier" for Super market | Cornell University | Current**
  A product identifier is a handheld device which helps senior citizen in the supermarket to get information such as Name, Expiry data, contents and harmful ingredients of the product through headphone or smartphone app. 31 system modelling tools were used to design such as *CVP, Annotated concept sketch, Context Diagram, Originating and derived requirement, Use Cases, Use case behavioral diagram, Morphology tables, FFBD, IDEF0, GQM, Decision Matrixes, AHP, QFD, State Diagram, ODT, Interface Matrix, VCRM, RPN, Parametric Diagram, Timeline etc.*

HONORS AND AWARDS

- Earned a "**SIX SIGMA- BLACK BELT CERTIFICATE"** in 2016.
- A certificate of excellence from Navrachana University for **Highest CGPA for 3rd Year** (HIGH PERFORMANCE AWARD).
- Certificate of merit for winning the zonal level line follower robotics competition and selected in the top teams for national level competition held at IIT Bombay, organized by Robospecies.
- Certificate of merit for winning the zonal level Robocup competition and selected in the top 32teams for national level competition held at IIT Kharagpur, organized by Virscent.
- Reached the semifinal of Robowar competition at MSU (Vadodara, Gujarat) and SVNIT (Surat, Gujarat).

CONCEPTS WELL EDUCATED (Other than core concepts of Mechanical Engineering)

Operations and Supply chain: *Scheduling and Sequencing, Demand forecasting, MRP, Global Project Management, Queuing theory, Shadow Price, New Vendor Model, Reshoring, Inventory optimization, Forecasting and Replenishment, Outsourcing, Discrete event simulation.*

Business Strategies and Entrepreneurial tools: *Bass Model Forecasting, Business Model Canvas, ERP(SAP), Saw tooth Analysis, Blue Ocean Strategy, Product Portfolio, R&D portfolio tools, New product Development, House of Quality, Net Value Worth, Market analysis, Market Size, Core capabilities and competencies, S-curve*

System Engineering and Design thinking tools: *Use Case Diagram, Originating Requirements, QFD, Analytical Hierarchy process, Flow of Thoughts, Activity Flow Diagram, storyboards, Functional Flow Block Diagram, IDEF0, Customer Affinity Process, ODT, Fault tree analysis, Annotated Concept Sketch, Use case behavioral diagram, Concepts Fragments, Combination table, State Diagram, Behavioral test plan.*

Quality and Reliability: *SIX SIGMA, Reliability, DFMEA, Quality Control, DOE, Process Capability (Performance and capability indices), Factorial design, DMAIC, Response surface method, Failure analysis (Root cause analysis), Statistical process control charts.*

Manufacturing: *3D printing, Lean Manufacturing, 5S, Kaizen, World Class manufacturing, FMS, Production Planning & Control, Kanban, Line balancing, Tolerances & dimensioning, Manufacturing machines, tools and processes (Injection molding, lathe, drilling, Jigs, fixtures etc.)*

CONFERENCE / WORKSHOP / SEMINAR / TRAINING

- Participated in workshop on *"Non Destructive Testing"* organized by "Mechanical Department, Navrachana University", Vadodara.
- Participated in "Car Disassembly Workshop" organized by SVNIT at Surat, Gujarat in 2013.
- Participated in "National conference on innovation in robotics" for 2days at ITM University at Vadodara, Gujarat.
- Gave presentation on- "Review on Road Accidents at National conference" organized at Navrachana university, Vadodara, Gujarat in 2015.