AYUSH SINHA

3rd year Undergraduate
Mechanical Engineering
Indian Institute of Technology, Kanpur, INDIA
Website: http://iamayush.github.io/

Address: B-328/10, IIT Kanpur,Kanpur,INDIA-208016
Phone: +91 9628424712
email: ayushs@iitk.ac.in, ayush7.sinha@gmail.com

EDUCATION

Qualification	Institute	Year	Performance
BTech Mechanical Engineering	Indian Institute of Technology Kanpur	2013-2017	CPI 9.2
Intermediate (12th CBSE)	Delhi Public School, Indira Nagar, Lucknow	2013	92.4%
High School (10th CBSE)	Delhi Public School, Indira Nagar, Lucknow	2011	CGPA 10

ACADEMIC ACHIEVEMENTS

- Received **Academic Excellence Award** in 2015 at Indian Institute of Technology Kanpur
- Ranked among **Top 0.2%** of all applicants in Joint Entrance Examination for engineering in India in 2013
- Secured **All India Rank 63** in U.P. State Engineering Entrance Examination 2013 out of total 1.5 lac candidates
- Awarded Certificate of Merit for being among the **Top 0.1%** of successful candidates of All India Senior School Certificate Examination in Physics by Central Board of Secondary Education in 2013
- Awarded Gold Medal for securing **City Rank 1** and **State Rank 8** in Science Olympiad Foundation's 14th National Science Olympiad
- Awarded Gold Medal for securing **All India Rank 41** in National Level Science Talent Search Examination in 2012
- Awarded Certificate of Merit for obtaining **highest grade (A1) in all subjects** in All India Secondary School Examination 2011 by CBSE

INTERNSHIP

▪ **TATA MOTORS LIMITED LUCKNOW**
SUMMER INTERN (19TH MAY 2015– 16TH JUNE 2015)

Project Title: "*Problem resolution after proper Root Cause Analysis for specified part belonging to vehicle's chassis*"

- Elimination of recurring manufacturing defects in a cross-member belonging to the chassis of a particular commercial vehicle
- Studied the concepts of Quality Assurance and Quality Control and TML's methodology for their implementation
- Studied the assembly line functioning and observed how the given part is fitted and comprehend the problems caused by it
- Visited the ancillary producing the part and inspected all the manufacturing processes involved
- Identified the defect causing steps through step wise analysis of processes mentioned in the part's process plan
- Redesigned the riveting fixture and ordered replacement of the brake-press' punch to successfully eliminate the defect
- Established and ensured correct implementation of Quality gates at ancillary to ensure that part quality aligns with TML's standards
- Worked with the Supplier Quality team and communicated with other departments like the Engineering Research Centre and Line Office

PROJECTS

▪ **ROBOCON 2015 – ROBOMINTON**
MECHATRONICS PROJECT (Centre for Mechatronics, IITK) (SEPTEMBER 2014 – MARCH 2015)

- Designed and built two badminton playing robots for doubles match on an actual size court
- Synthesized mechanisms for racket actuation to implement various badminton strokes
- Designed a double actuation mechanism which replicates the combined motion of the elbow and wrist joints while playing a stroke
- Selected suitable pneumatic actuators and DC motors for driving the mechanisms with required speed and force
- Implemented Holonomic drive using Omni wheels to allow motion in several directions along with rotation about its own axis
- Developed CAD models of the robots and fabricated them using traditional and advanced manufacturing processes
- Worked for six months along with the electronics, programming and image processing team for the realization of the project
- Finished Eleventh in eighty-five teams representing different universities from all over India

- **DESIGN OF SHAPE MEMORY ALLOY BASED ACTUATOR AND ITS INTEGRATION WITH A MULTI-LINK GRIPPER DESIGN OPTIMIZATION PROBLEM** (Dr. Bishakh Bhattacharya, Mechanical Engineering, IITK) (ONGOING)

- Designed Shape Memory Alloy (SMA) based actuator inspired by the functioning of pennate muscles found in many animals
- Established kinematic and force formulations for the SMA based actuator
- Established kinematic formulations and defined constraints for two gripper configurations, one artificial and other found in nature
- Currently working towards integration of actuator output with the gripper optimization process

- **THERMODYNAMIC ANALYSIS OF SOLAR POWERED CLOSED CIRCUIT VAPOUR TURBINE SUMMER PROJECT** (Dr. Santanu De, Mechanical Engineering, IITK) (MAY 2015 – JULY 2015)

- Development of a solar powered vapour turbine for production of electricity at remote locations that don't have access to the grid
- Thermodynamic analysis of cycle designs proposed for the system and suggesting alterations to improve efficiency
- Simulations of designs using ASPEN HYSYS for comparison of their efficiencies
- Design of Solar Heat Collector for maximising highest temperature achieved

- **MODEL OF AN AUTOMATIC CAR PARKING SYSTEM COURSE PROJECT** (Manufacturing Processes Laboratory) (JANUARY 2015 – APRIL 2015)

- Prepared CAD design and fabricated a small-scale hand-driven model of an automatic car parking system
- Studied about different kinds of force/motion transmitting mechanisms like gears, belt-pulleys and chain sprocket
- Gained hands-on experience with basic machine-shop operations and conventional machining methods

POSITION OF RESPONSIBILITY

- **SENIOR MEMBER** – TEAM ROBOCON IITK 2015

- Represented IIT Kanpur in National Robocon 2015 (Robotics Contest) organized in Pune, Maharashtra
- Worked with a team comprising of 30 students from different engineering disciplines and years of study
- Led and guided fifteen freshers to create two robots for playing doubles badminton matches against other teams
- Arranged exhibitions at IIT's technical festival Techkriti 2015 and annual Science and Technology Day of IIT Kanpur
- Organized recruitment test and interview shortlisting for freshers for contingent of 2016
- Felicitated by the Science and Technology Council IIT Kanpur for contributions towards the science and technical activities of the Students' Gymkhana

KEY COURSES AND SKILLS

- **CORE** : Theory of Mechanisms and Machines, New Product Design and Prototyping*, Dynamics, Manufacturing Processes, Finite Element Methods*, Nature and Properties of Materials, Engineering Design and Graphics, Thermodynamics, Fluid Mechanics, Mechanics of Solids

- **BREADTH** : Fundamentals of Computing, Introduction to Electronics, Introduction to Electrical Engineering, Complex Variables, Partial Differential Equations, Matrix and Determinants/ODE, Introduction to Electrodynamics

- **SKILLS** : SolidWorks, Autodesk Inventor, Aspen HYSYS, Autodesk AutoCAD, MATLAB, Web Development, Android Development, C, C++

Starred (*) courses would be completed by May 2016

EXTRA CURRICULAR ACTIVITIES

- Stood 2nd in Wild Soccer in Takneek 2015 – the intra-institute technical festival of IIT Kanpur. The contest required the teams to build two robots aimed at playing soccer and destroying the opponent's robots.
- Won the Stop-Motion Film making contest in Spectrum 2014 – the intra-institute film festival of IIT Kanpur
- Participated in Gearloose in Takneek 2013, a technical contest that required the participant to build a small mobile device that traverses a given track solely through conversion of one form of mechanical energy to another.