Shanu Vivek **09010066**
Mechanical Engineering **UG Third Year (B.Tech.)**
Indian Institute of Technology, Bombay **Male**
DOB: 11.06.1991

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2012	7.27
Intermediate/+2	CBSE	Central Academy Ranchi	2009	84.00
Matriculation	CBSE	DAV Simdega	2007	93.60

WORK EXPERIENCE

Tata Motors, Pune *May'11-July'11*

*Engine torque control during gearshift in an **Automated Manual Transmission***

Worked as a **"Project Trainee"** at Advanced Engineering Department of Engineering Research Centre, Tata Motors.

- Studied dynamics of vehicle during a gearshift and properties of the clutch used and developed a predictive MATLAB model to dictate the engine torque desired during to achieve a smooth gearshift.
- The innovative concept of **Automated Manual Transmission** is to be implemented in new models of **Tata Nano EV**.
- Feasibility Study: **Nano Range Extender.** A gen-set was to be used in order to charge the battery packs.

INTERNATIONAL/ NATIONAL TECHNICAL PROJECTS

Passionately involved in technical activities of automobile engineering projects for 3 years

Formula Student (Electric)-UK 2012 *Oct'11 to till date*

Formula Student is an international competition conducted by SAE seeing the participation of 80 international universities. The objective of the competition is to design and manufacturing of a Formula-1 style race car.

Subsystem Head- Powertrain

- Decided the topology of the drive-train for the vehicle
- Studied the dynamics of the vehicle in order to choose the right torque-**biasing differential** , reduction for the **chain sprocket** system and **Continuous Velocity Joints**
- Estimated forces on each component under dynamic conditions and for those loads designed (CAD and FEA) the motor mounts, differential mounts, couplers, sprockets and drive-shafts. **Material selection** and **manufacturing strategy** was decided for each component. Efforts were put in order to ensure a **light** and **modular assembly.**
- **Reverse engineered** a commercial tripod housing to design and manufacture a custom tripod housing of suitable dimension

Baja SAE India 2012 *Feb'11 to till date*

Baja SAE India is a national competition seeing the participation of 100 Indian teams. The objective is to design and manufacture an All Terrain Vehicle.

Subsystem Head- Powertrain

Custom F-N-R gearbox design and its manufacturing. Dynamics of vehicle was studied thoroughly and a reduction ratio for gearbox was predicted. Shaft design, bearing selection, gears, casing and gear shifter design were dealt with.

- CVT Tuning. Studying and improving the response of '**CVT- Gearbox**' combination.
- Design of drive shafts and selection of the joints
- Sorting the problems related to the Engine

- Testing the power-train for its **reliability and performance.** Aiming for optimum design and weight reduction. Current gearbox is half the weight than that of gearbox for Baja SAE 2011
- Mentoring the juniors on the team to take up additional technical responsibility

Baja SAE India 2011 *July'10- Jan'11*

- Our ATV 'PRITHVI 2.0' was awarded the ICAT Raftar Award worth Rs. 1 lac for being the **lightest and fastest vehicle** at the competition
- My role: Learning the basics of power-train design for an ATV and active involvement in the manufacturing of the whole car

KEY ACADEMIC PROJECTS

Materials and their Processing for IC engine Pistons: *Prof. G.V Prabhugaonkar*
The project aimed at learning what already has been done and using that experience in prediction of a material which can be used, in future, to manufacture pistons of IC engines

Mini-UID (unique identity): *Prof. D.B Phatak*
The project was about development of a computer program using C++ which would take and keep records of every student on the campus using their finger prints. This program was prototype of the project called 'Unique Identity' started by Government of India

Design of test-setup for testing of CFRP: *Prof Ramesh Singh*
A rough CAD model of the setup was created. Forces were estimated for different tests like Tensile, Shear and Inter-laminar. An FEA was run in Ansys for the same. Then the design was modified to ensure that deflection in the system were order of few microns. The setup was kept as light as possible. Fixtures for different tests were also designed

TECHNICAL SKILLS

Computer Aided Design: SolidWorks, Finite Element Analysis: Ansys, Matlab and Matlab Simulink, Programming language C++, MS Office

INTERESTS AND HOBBIES

Product Design, Automotive Engineering, Economics, Singing, Photography, Trekking, National Cadet Corps

POSITION OF RESPONSIBILITIES

Core Team Member, IIT Bombay Racing
A team dedicated to design and manufacture automobiles to compete at national (mini Baja) & international (Formula Student) events

1. Aiding and supervising juniors in manufacturing and fabrication related tasks
2. Ensuring that the time lines for projects of large magnitude such as Baja and FS are followed
3. Contacting industries, labs, professionals and professors to procure help and suggestions in coming up with a optimised, reliable and working final product
4. Keeping juniors informed enough to be motivated and mentoring them towards the manufacturing and designing process

RELEVANT COURSES

Mechanical- Solid Mechanics, Fluid Mechanics, Strength of Materials, Engineering Metallurgy, Manufacturing Processes, Thermodynamics, Industrial Engineering, Operational Research, Heat Transfer, Applied Thermodynamics, Kinetics and Dynamics of Machines, Fuels and Combustion, Textile Machine Design and Automation.

Others (Minor) - Data Analysis and Interpretation, Micro and Macro-Economics, Managerial Economics, Remote Sensing, Image Processing, Design Issues, Psychology