

# Vansh Sharma

Ann Arbor, Michigan 48105 • (408) 444-0948  
vanshs@umich.edu • linkedin.com/in/vanshsharma

A Proactive Masters student with 5 years of R&D experience in versatile projects. Offers innovative solutions by leveraging industrial product design & software analytical skills. Worked on 3 Formula Student racecars.

## EDUCATION

- M.S., Mechanical Engineering, University of Michigan, Ann Arbor, Michigan 2018 – 2020  
GPA – 4.0/4.0
- B-Tech., Mechanical Engineering, Delhi Technological University, New Delhi, India 2013 – 2017  
GPA – 3.9/4.0

## LEADERSHIP

- Engineering Research Symposium (ERS) 2019  
Judging & Advance Committee Co-Chair. Hands on experience of managing diverse individuals.
- Formula SAE, Team Leader 2013 – 2017  
Lead a team of 35 engineers for 2 Formula SAE events. Achieved the best result in the history of the team.

## PROJECTS

### GRADUATE

Bayesian Inference for Chemical Reaction Model, University of Michigan 2019-Present  
*Researcher*

- Learning reaction rates of radical mechanism from a large data of novel fuel to predict the overall accuracy of the mechanism and optimize the number of radicals.
- Used Mean Field Variation to optimize high dimensional models and quantify uncertainty in the model.

Key software used: Python, MATLAB, Physical Model Learning, Cantera.

Helical Drive Engine, University of Michigan 2019-Present  
*Researcher*

- Combustion analysis of Helical Drive IC Engines for low power operations on GT Power to improve the power output and overall efficiency. Working on patented technology.
- Benchmarking existing engine; acquire data to develop a GT Power model for gasoline and diesel fuel engines.

Key software used: Solid Works/CAD, Converge /CFD Simulation, Unix/Shell, High Performance Computing, GT-ISE/Power.

Dynamic Species Reduction; Co-Optima, University of Michigan 2018-2019  
*Research Assistant*

- Improving efficiency of combustion analysis of IC Engines by binning out redundant species & reducing computational time.
- Target to improve the computational time by 200% by developing the algorithm.
- Worked on HCCI Combustion, DISI Engine and CFR engine simulations and analysis.

Key software used: Solid Works/CAD, CFD Simulation, Unix/Shell, High Performance Computing, MATLAB, GT-ISE/Power.

### UNDERGRADUATE

FORMULA SAE, Delhi Technological University

*Team Leader, 05/2014 - 08/2017*

- 2017: **Team Leader**; managed team of 35 undergrads for FS-UK 17 and FS-Bharat, 18. Best result achieved; 2<sup>nd</sup> Place.
- 2016: Chief Technical Officer & Head of Department, Powertrain, for the Formula Student UK, Silverstone, 2016, the team stood as the **Best Asian Team**, 198 teams took part in the competition.
- 2014-15: Head of Department, Powertrain - Exhaust, Lubrication, Cooling System, Electricals and Manufacturing for Formula Student India 2015-16. Team finished 7th overall. Designed various critical components.

Key technologies/courses used: MATLAB, Ricardo Wave, FEA, ANSYS-Fluent, 3D-Printng(SLS), CNC Machining, Design for Manufacturing, Carbon Fiber Molding, Data acquisition and analysis.

Alternate Fuels, Bio Gas, Delhi Technological University

*Research Assistant, 01/2016 – 05/2017*

- Researched the available energy scenario in the university campus to setup a generator of 1.2 kW for available biogas resource (used raw organic waste from dining halls).
- Developed a low cost decarburizing plant for CO<sub>2</sub> removal, enriching the biogas content by 40%.

### Optimization of Horizontal Axis Wind Turbine, Delhi Technological University

MAJOR THESIS, 05/2017

- Using Blade Element Momentum Theory developed an optimized blade design and compared NACA 4412 and S832 profiles in wind turbine. Performance gain of 48% was observed.
- Developed measuring tools for rotor speed and pressure in the wind tunnel with error of 1.2%.
- Proposed use of vortex generators using BAY Model and BATCHELOR's Vortex Model to increase the performance by 10%.

### Optimization of Horizontal Axis Hydrokinetic Turbine, Delhi Technological University

MINOR THESIS, 05/2016

- Studied hydrofoils & designed MATLAB code to optimize blade; Developed profile was simulated on ANSYS and HyperMesh & manufactured via 3D printing.
- Conducted test in water tunnel to simulate actual working conditions and performance of 15W in a flow velocity of 2m/s with blade radius of 0.8m was observed.

## WORK EXPERIENCE

PHILIPS LIGHTING, India

July 2017 – July 2018

Technical Assistant

- Front End Innovation; Designing luminaires as per market requirements/ Engineered to Order.
- Key Areas of Responsibility – Thermal Analysis, Design Optimization, Value Engineering of products & Reverse engineering competitor products. Computing FMEA & reliability of the products via testing.
- Successfully launched 2 products. Changed System design of existing product enhancing consumer safety and saved 34% cost by improving package design.

Key skills used: Solid Edge/CAD, Solid Works/FEA (Analysis), Siemens PLM/Project Management, Injection Molding, Pressure Die Casting, Sheet Metal Operations.

PVL – SANDEN GROUP, India

May 2015 – Aug 2015

Intern

- Developed a Radiator Design tool and studied various performance parameters of a heat exchanger; Implemented the tool for developing heat exchanger for Formula Student Car.
- Improved Heat Transfer by 20% while reducing the frontal area by 52% and reducing the weight of the system by 2kgs.

Key skills used: Heat Transfer, Visual Basics/GUI Development, Aluminum Brazing & Manufacturing.

## TECHNICAL SKILLS

Python	MATLAB	C/C++	Unix/Shell	Solid Works	Solid Edge	Siemens PLM	HyperMesh
ANSYS	Ricardo	WAVE	GT ISE	Converge CFD	Cantera	Statistical R	
Bayesian Inference		Statistical Modelling					

## RESEARCH PUBLICATIONS

- "[Design and Pitch Angle optimization of Horizontal Axis Hydrokinetic Turbine with constant Tip Speed Ratio](#)" published in MATEC Web of Conferences, NUS, Singapore (ISSN: 2261-236X).
- "Low-Cost Manufacturing and Implementation of an Optimized Model of Horizontal Axis Hydrokinetic Turbine and Test Bed Assembly" published in RAME 2016, DTU, India.

## AWARDS & ACCOLADES

- Philips Lighting CEO Recognition Award 2018– For CSR activities; Lighting up schools and homes of underprivileged children.
- B.Tech. – Graduated: First class with distinction, Top 10% of the class.
- Position 2nd – Formula Student India 2018. 97 teams participated. BEST RESULT IN THE HISTORY OF TEAM.
- Position 50th – Formula Student United Kingdom 2017. 220 teams from around the world participated.
- Position 57th – Formula Student United Kingdom 2016. 198 teams from around the world participated.
- Principals Award – Highest Marks in Physics, AISSCE 2012.

Extra-Curricular: State level Volleyball player, hiker, avid traveler, Formula One and star gazer.