

# SADAIVAL SINGH

B.Tech - Mechanical Engineering  
Minor in Electronics and Communication Engineering  
Indian Institute of Technology Guwahati

sadaival.singh@mail.mcgill.ca  
sadaival.singh@gmail.com  
<https://www.linkedin.com/in/sadaival-singh/>  
<https://sadaival.github.io/>  
+1-438-779-5005/

## Education

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
M. Eng	McGill University	3.9/4 (Current)	2025(expected)
B.Tech	Indian Institute of Technology, Guwahati	8.43/10	2021
Senior secondary	CBSE board	92.2%	2017
Secondary	CBSE board	9.4	2015

## Experience

### Bajaj Auto

April 2022- Oct 2022

- **Assistant Manager at Bajaj Auto.**

- Worked as Component Development Engineer in Casting department, handling operations for production of Engine castings. Planning of tools, fixture, and process for manufacturing engine castings with required production rate and quality standards. implemented Cycle time optimization, Cost reduction, Tool and part commonization for various casting parts.

- **GTE at Bajaj Auto.**

Sep 2021- April 2022

- Worked in 2-wheeler fuel tanks paint shop for calculation of all major machinery equipment required for new Paint shop (Pumps, Blowers, Ovens).
- Optimized Wood usage for bike packaging palette by doing force calculations for wooden beams and saving cost.

- **Summer Intern at Bajaj Auto.**

June 2020- July 2020

Determined critical wall thickness points in blow molded and rotomolded fuel tanks. Designed a common fixture for accommodation and handling of fuel tank.

### Ace Manufacturing Systems

- **Research and Development**

Nov 2022- Jun 2023

- Worked on Vision based control system for WAAM (Wire Arc Additive Manufacturing) and PBF (Powder Bed Fusion) machines.
- Developed Vision based tool measurement and breakage system.
- Developed a low-cost 3D Scanner for inspection of 3D printed parts and substrate by capturing the point cloud data through a line laser.
- Optimization of kinematic mechanism of door within required constraints using python.

## Teaching Assistant

- **MECH 383 – Applied Electronics and Instrumentation**

Jan 2024- April 2024

## Publications

- Singh, Sadaival, Ambrish Singh, Sajan Kapil, and Manas Das. "Utilization of a TSP solver for generating non- retractable, direction favouring toolpath for additive manufacturing." Additive Manufacturing (2022): 103126.
- Singh, Sadaival, Ambrish Singh, Sajan Kapil, and Manas Das. "Generation of Continuous and Sparse Space Filling Toolpath with Tailored density for Additive Manufacturing of Biomimetics." Computer-Aided Design (CAD) (2024): 103718

## Projects

- **Computer vision application in Additive Manufacturing**

Nov 2022-present

Prof. Sajan Kapil, Assistant Professor, Dept. of Mechanical engineering, IIT Guwahati

Implementation of Computer Vision and Deep learning Algorithms for in-situ quality control of Additive manufacturing processes of WAAM and PBF. Melt-pool monitoring in WAAM and defect monitoring in powder bed deposition and laser melting process of PBF

- **Area Filling Method for 3D Printing**

Prof. Sajan Kapil, Assistant Professor, Dept. of Mechanical engineering, IIT Guwahati

May 2019-present

Investigated on application of Traveling Salesman Problem for Area-filling strategies in 3D printing. Developed different methods to fill a given 2D geometry. Made software to generate and export toolpath for given input geometry. Currently working on density based functionally gradient toolpath algorithm (Publication under review).

- Sadaival Singh, Ambrish Singh, Sajan Kapil, (2021), "Non-retractive toolpath planning using TSP solver", 4<sup>th</sup> international conference on "Holistic innovation in Additive Manufacturing (HI-AM)", 1– 2 June, the University of Waterloo, Canada in Online Mode

- **SAE Efficycle 2018**

SAE, IIT Guwahati

Jun 2018-Sep 2018

<http://bit.ly/2018AEGS>

Manufactured Efficycle, which is a three-wheeler tadpole configuration hybrid vehicle. **Designed Automatic gear shifters for the Efficycle** which changed gears according to speed automatically for proper power transfer.

- **Formula Student Vehicle**

SAE, IIT Guwahati

Dec 2018-Jan 2020

Designed and Manufactured a Formula Student race car for participation in Formula Bharat. Responsible for **suspension and electronics subsystem**. Overall technical management of other subsystems as team captain.

- **Hand Gesture Recognition**

Implemented **Computer Vision** on Python to detect various hand gestures from camera.

*Feb 2018*

*<http://bit.ly/2018HGR>*

---

## Technical skills

- **Programming languages:** C, C++, Python, MATLAB
  - **CAD software:** SolidWorks, Catia, NX, Solid Edge
  - **Simulation software:** Ansys, EDEM
  - **Operating System:** Windows, Linux
  - **Miscellaneous:** Machine Learning, Deep Learning, Computer Vision, ROS
- 

## Key courses taken

- |  |   |
|--|---|
| • Machine Learning (Coursera)                    | • Kinematics of machinery                 |
| • Applied Robotics                               | • Fluid Mechanics                         |
| • Control Systems                                | • Machine Design                          |
| • Optimization methods in Engineering            | • Soft computing in Engineering           |
| • Industrial Engineering and Operations Research | • Modelling, Dynamics, and control of EVs |
- 

## Positions of Responsibility

- **Team Captain, Formula Team of IITG:** Responsible for distribution of work, setting up deadlines and proper work execution of a team of 20 members.
  - **City representative for Technothon 2018:** Organized the Technothon Exam in Chandigarh, by bringing 300 registrations from various schools in Chandigarh, establishing a Test Centre and managing the final exam.
- 

## Achievements

- **Innovation Award:** Won Innovation award at SAE EFFICYCLE 2018 for designing automatic electronic gear shifters. The team achieved an overall rank of 9 among 72 teams in the event.
  - **Group Mathematics Olympiad 2015:** Selected in top 30 students from India to participate in INMO (Indian National Math Olympiad).
  - **Joint Entrance Examination 2017:** Secured All India Rank 2346 among 1.286 million candidates appearing for the test.
- 

## Extracurriculars

- **Conducted Lecture Series:** Gave lectures on engine and suspension subsystem on behalf of SAE IITG.
- **Spardha 2018:** Secured 4th rank in inter-hostel sports event in squash.
- **Kriti 2018:** Secured 2nd rank in inter-hostel technical event on making brake fitted RC car.