

# Vikalp Sinha

Mechanical Engineering  
Bachelor of Technology  
Indian Institute of Technology,  
Patna

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## Education

<b>Indian Institute of Technology, Patna</b> Bachelor of Technology in Mechanical Engineering Current CPI- <b>7.74</b>	<b>2013-Present</b>
<b>B.D. Public School, Patna</b> Intermediate- Central Board of Secondary Education Percentage- <b>92%</b>	<b>2011-2013</b>
<b>St. Karen's Secondary School, Danapur</b> Matriculation- Central Board of Secondary Education Grade- <b>9.6/10</b>	<b>2010-2011</b>

## Interests

Design  
Robotics and Automation  
Aerodynamics

## Technical Skills

Softwares-	AutoCAD, SolidWorks, Adams, Matlab, Ansys
Programming-	Arduino, AVR, C, Java
Operating System-	Windows, Linux

## Projects

### ❖ Stair Climbing Wheel (2014)

- This project was conceived to be used by people, who have lost their ability to walk, to climb up stairs without the help of others.
- It is fully autonomous and can climb stairs by its own.
- It has a sensor that registers the distance of wheelchair from the first stair and, using image processing, counts the number of stairs to climb.
- My part in the project was to design the mechanism of the project and to derive an equation that, using sensors and image processing, evaluates the number of stairs to climb.

### ❖ Solar Tracking Parabolic Mirror (2014)

- This project was designed to increase the efficiency of a parabolic mirror in capturing the solar radiation.
- It is fully autonomous. It powers off at dusk and powers on at dawn.
- It uses two motors to create motion in one hemisphere with a solid angle of 2.24 steradian (apex angle of 100°)
- It has a modified LDR sensor that not only detects light but also determines the direction from which it is coming.
- My role in the project was to design all the components of the project including the modified LDR.

### ❖ **Reciprocating Vacuum Pump (2014)**

- This project was to demonstrate a working model of a reciprocating pump.
- An innovative design for the valve was used in the project which was my role in the project. This design was used to increase the overall efficiency of the pump.

### ❖ **Bamboo Processing Tool (2015)**

- This project was conceived to help rural workers to increase their productivity. This is done by designing a tool that can cut the outer layer of bamboo tree at a faster rate.
- My role was to design a curved tool with a blade that can cut the cylindrical outer layer of the tree in one go.

### ❖ **Line Follower (2013)**

- Designed and created three different categories of line followers:
  - a) Without using microcontroller. Just using simple electronic components
  - b) Using Arduino microcontroller
  - c) Using AVR microcontroller

### ❖ **Hydraulic Arm (2013)**

- Designed and created a manually controlled robotic arm with hydraulics using as little resources as possible.
- My role was to design the claw of the arm that would be able to grab small objects of varying dimensions without slipping.

## **Courses Taken**

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### ❖ **Core**

- Thermodynamics
- Applied Thermodynamics
- Kinematics of Machines
- Fluid Mechanics
- Design of Machines
- Heat and Mass Transfer
- Mechanical Measurements
- Manufacturing Technologies

### ❖ **Non Core**

- Biochemistry
- Quantum Mechanics
- Relativity Theory
- Advanced Physics
- Computer Programming( C, Java)
- Numerical Methods
- Linguistics
- Economics

## **Awards and Achievements**

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- ❖ Zonal winner of Indo-US RoboLeague 2013
- ❖ National Finalist of Indo-US RoboLeague 2013
- ❖ Second rank in Hydraulic Arm competition for freshers in 2013
- ❖ Qualified for Indian National Mathematics Olympiad two years in a row

## **Declaration**

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I hereby declare that all the details furnished above are true to the best of my knowledge and belief