ROBOTICS CLUB
NIT ALLAHABAD

TSAW
Transforming Humanity

A COLLABORATION OF ASTROWING MNNIT AND TSAW.

Jigyasa

BUILDING ON IMAGINATION

INTRODUCTION TO SIMULATION SOFTWARE IN ROBOTICS

ABOUT US

Robotics Club MNNIT

Robotics Club MNNIT is a diverse group of robotics enthusiasts from all the college departments, which runs under the umbrella of the Student Activity Centre of MNNIT Allahabad.

Established in 2016, we are mainly concerned with building robots for academic purposes, competing at national events, or even building just out of imagination. This puts us in frequent contact with a plethora of software, hardware, and technologies, like Computer Vision, Simulation Softwares (Gazebo, Pybullet, etc.), CAD Softwares, ROS, devising algorithms, path planning, Machine Learning, Microcontrollers, Kinematics to name just a few of many. Since its creation, this club has seen the completion of hundreds of projects,
participated and won accolades in multiple national-level events, and organized various workshops with a decent footfall.

Working closely with the industries, our people regularly acquire lucrative tech giants packages, internships in IITs, and various tech companies.

Our club has also been the birthplace of a startup TSAW in the drone sector, gaining ground in the field and as a company.

We have a team of friendly experts equipped with all kinds of tutorials and workshops along with a compelling workspace to make you an integral part of this rapidly expanding world.

Jigyasa

"Tell me and I forget, teach me and I may remember, involve me and I learn."
-Benjamin Franklin

Jigyasa is the workshop venture of the Technical clubs of MNNIT, namely Robotics, Aeroclub, and Astrowing, in collaboration with TSAW, a fully functional drone startup that emerged from our clubs. We are motivated by the desire to supplement education with the present-day industry requirements, making the participants future-ready with their skills and a problem-solving mindset.

The workshops under Jigyasa comprise various projects, activities, and interactive sessions, which will help you understand the most difficult concepts in the most comfortable manner. Hence, by emphasizing innovation and imagination, these workshops will instill in your minds a profound scientific temperament and fascination towards technology.

OVERVIEW

"Our Brain Simulates Reality"

One of the foremost skills of a capable engineer and, especially, a robotics engineer, is the ability to simulate and test ideas before moving on to the actual product. Simulation helps you test your algorithms rapidly, and thus, helps you create better products. It also allows you to carry out complex projects with limited resources.
A good grasp on simulation softwares will surely be a great asset to your portfolio as a budding engineer. But, the resources for most of these workshops are very distributed, and documentations are not easy to begin with.
Well, don't worry because in this workshop, we will equip you with some of the best, state-of-the-art simulation softwares to build and test your ideas, so that your imaginations are limitless.

Prerequisties:
None

Target Audience:
Anyone Interested

WORKSHOP SCHEDULE

DAY 1:

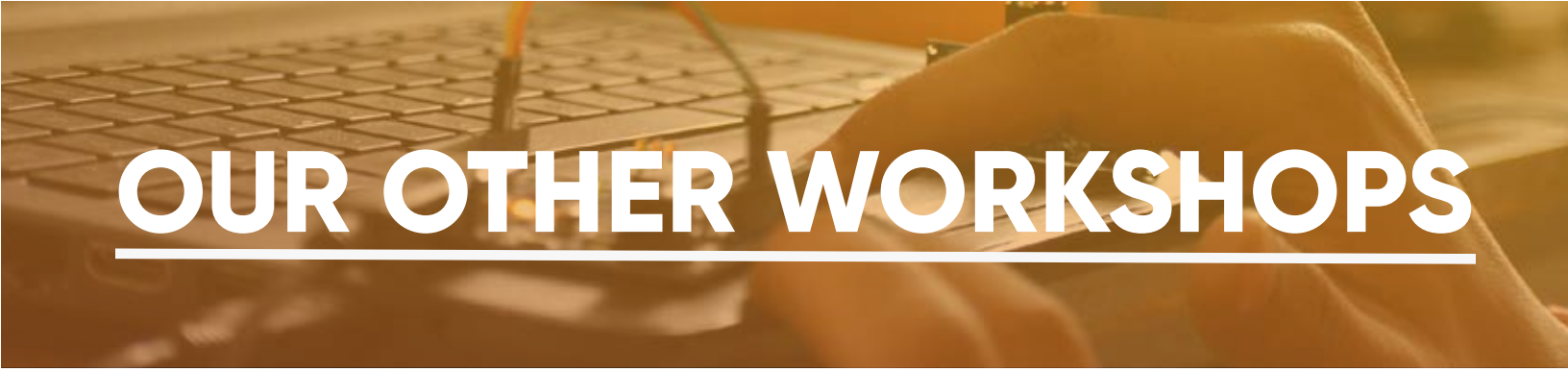
- INTRODUCTION TO ROBOTICS-UNDERSTANDING PERCEPTION, PLANNING AND CONTROL
- UNDERSTANDING THE NEED FOR SIMULATION IN ROBOTICS
- GETTING STARTED WITH SIMULATION SOFTWARES
- INTRODUCTION TO TinkerCAD, V-REP, Proteus, PyBullet, Webots AND Gazebo
- REVEALING THE WORKING OF SIMULATION SOFTWARES-WHAT LIES BEHIND THE GUI
- MAKING LINE FOLLOWER CIRCUIT IN TINKERCAD (WITH MOTOR DRIVER)

DAY 2:

- IMPORTING CAD MODELS IN ANY SIMULATION SOFTWARE-UNDERSTANDING URDF FILES
- GETTING STARTED WITH PyBullet
- IMPORTING A ROBOTIC ARM IN PyBullet
- IMPORTING CAMERA AND USING IT IN PyBullet
- IMAGE PROCESSING IN PyBullet
- WAREHOUSE AUTOMATION PROJECT DEMONSTRATION IN PyBullet

DAY 3:

- GETTING STARTED WITH WEBOTS
- MAKING ROBOT MODEL
- INCORPORATING SENSORS AND MOTORS IN WEBOTS
- MAKING A MAZE FOLLOWER IN WEBOTS
- EXPLORING COMPLEX ROBOTS IN WEBOTS
- INTRODUCTION TO ROS AND GAZEBO
- HOW TO DEVELOP ON SKILLS GAINED: PROJECT AND RESOURCES



OUR OTHER WORKSHOPS

ASTRONOMY

- Beginner's walkthrough of Astronomy
- Diving Deeper into the Cosmos
- Astronomy from an Engineer's Perspective
- Establishing an Astronomy Club

AEROSPACE

- Introduction to Flight
- A peek into the Aerospace Sector
- Getting Started with Drones
- Drone Automation
- Establishing an Aeroclub in your College
- First step to Aerodynamics with OpenVSP, F360 and Ansys

GENERAL

- Rise and Program
- Think3D: Fundamental of 3D Modelling and 3D Printing
- Learn3D: Introduction to CAD and 3D Printing

ROBOTICS

- Kickstart your journey into Robotics
- Introduction to Artificial Intelligence
- Introduction to Kinematics in Robotics using PyBullet
- Kit-up to Set-up: To Establish a Robotics Club
- Build your own Robot
- Introduction to Simulation Software in Robotics
- Stepping into Electronics and Arduino
- Introduction to Computer Vision with Raspberry Pi
- Introduction to Autonomous Vehicles with CARLA and Imitation Learning
- Internet of Things (IoT)

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