Lokesh Bansal

Researcher

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Robotics and Artificial Intelligence

Education

2021-Present **MTech in Robotics and Autonomous Systems**, *Robert Bosch Center for Cyber Physical Systems (RBCCPS), Indian Institute of Science, Bangalore, India*,
Working on Navigation and Control of Mobile Robots, RBCCPS

2016-2020 **BTech in Aerospace Engineering**, *Punjab Engineering College, Chandigarh, India*, *CGPA: 8.2/10*
Got AP Grade in Aircraft Performance, Aircraft Structures, Aircraft Propulsion Courses

2013-2015 **Intermediate/+2**, *OSDAV Public School, Kaithal, India*, *Percentage: 91.6%*

2012-2013 **Matriculation**, *Indira Gandhi Public School, Kaithal, India*, *CGPA: 10/10*

Experience

Teaching Experience

Feb'21 - Jun'21 **Assistant Professor**, *Punjab State Aeronautical Engineering College, Patiala, Punjab,*, India

Helicopter Engineering
- Key Topics covered: Helicopter Configuration, Control Requirements, Momentum Theory, Blade Element Theory, Auto-rotation, Vertical Flight, Forward Flight, Introduction to Navigation Guidance and Control for Intelligent Fight
- Lecture videos

Aircraft Structures
- Key Topics covered: Strength of Material, Truss, Thin-Walled Structures
- Lecture videos

Aircraft Performance
- Key Topics covered: Basics of Aerodynamics, Cruise, Climb & glide flight performance, Range & Endurance, Landing & Take-off Performance
- Lecture videos

Aircraft Stability and Control
- Key Topics covered: Longitudinal and Lateral Stability and Control, Dynamic Stability: Euler angles, Equations of motion, Longitudinal and Lateral-directional modes
- Lecture videos

Aug'20 - Dec'20 **Teaching Assistant**, *Punjab Engineering College, Chandigarh, India*
Aerospace Engineering Department
- Set Assignments, mentored and guided students in course projects

Internships

June'19 - Sep'19 **Intelligent Algorithms for UAV Automatic Landing On-board a moving platform**, ***[View]***
MITACS Globalink Research Internship Program 2019, Under Dr. Rene Jr. Landry, École de technologie supérieure, Montreal, Canada
- Performed hardware integration of Quadrotor, design, and implementation of Ground Mission System
- Developed algorithms using classical and state-of-the-art Deep Learning and Reinforcement Learning techniques for image processing and navigation such as Hough Transform, OpenCV, TensorFlow for intelligent object detection for drone landing

Jan'19 - June'19 **Data Analyst**

CSD Analytics and Insights at United Airlines in Gurugram, Haryana, India

- Analyzed large set of Operations data for Airlines Industry, creating charts and visualizations
- Generated insights based on different sets of data such as Delayed flight, Cabin functioning, etc.

May'18 - June'18 **Tribological behavior of Al6063 –Mild Steel tribo pair**

Under Dr. Satish Vasu Kailas, Tribology Lab, Indian Institute of Science, Bangalore, India

- Investigated the effects of various rubbing conditions that results in various wear and lubrication aspects of Aluminium and Mild Steel tribo-pair
- Worked with Computer-Aided Designing tools such as AutoCAD, Ansys etc. and learned to perform experiments on Tribometer, Raman Spectroscopy, Scanning Electron Microscope, etc.

Projects

Aug'21 - Dec'21 **Quadrotor Path Planning using Artificial Potential Field Approach**, *[View]*

Course Project: Foundation of Robotics under Prof. Shishir Kolathyan, IISc, Bangalore

- Implemented Artificial Potential Field approach for obstacle avoidance and trajectory generation
- Modelled 6-DOF model for Quadrotor with PID controller

Awards and Recognition

- Awardee of **MITACS Globalink Research Internship Program 2019**. Funded by MITACS, Canada and Ministry of Human Resource Development, India, a highly competitive initiative that selects interns from Mitacs partner countries to go to Canada for 12 weeks to undertake research projects at Canadian universities
- Secured **All India Rank 53** in Graduate Aptitude Test in Engineering (GATE) in Aerospace Engineering 2021
- Honoured by **Institute Color at Punjab Engineering College, Chandigarh** Institute's highest honour in recognition of exemplary achievements and contribution in various cultural activities working as the Chief Editor of Hindi Editorial Board at Punjab Engineering College, Chandigarh

Courses Completed

Robotics and Autonomous Systems	Introduction to Electronics, Foundation of Robotics, Design of Cyber-Physical Systems, Mathematics for Robotics, Dynamics of Linear Systems
Aerospace Engineering Core	Aerodynamics, Aircraft Structures, Aircraft Propulsion, Aircraft Stability and Control, Space Dynamics, Aircraft Materials and Processes, Aircraft Design, Computational Fluid Dynamics, Aircraft Engine Design, Aircraft Structural Analysis and Design, Compressible and Finite Wing Aerodynamics, Gas Dynamics, Vibration and Aeroelasticity, Helicopter Dynamics, Air Transportation and Operations, Composite Materials
Other courses	Physical Chemistry, Numerical Analysis, Electromagnetic Theory, Engineering Drawing, Psychology,Environmental Studies, Technical Communication, Entrepreneurship and Project Management

Advanced Technical Skills

Programming Language	C, C++, Python, MATLAB, SQL
Modelling and Analysis Tools	Solidworks, ANSYS, AutoCAD
Simulation	ROS, Gazebo, Simulink
Languages	English (Native), Hindi (Native), Sanskrit (Elementary)

Interests

- Mind-Controlled Robotics, Wearable Soft and Evolutionary Robotics
- Artificial Intelligence and Machine Learning/ Deep Learning/ Reinforcement Learning
- Aerial Robotics, Path Planning, Navigation and Control

- Bio-inspired robotics and soft robotics

Conference Poster Presentation

- *"Intelligent Algorithms for UAV Automatic Landing on-board a Moving Platform"* in Artificial Intelligence and Signal Processing 2020 Conference organized by IEEE Hyderabad, Vijayawada, Andhra Pradesh, India

Extra-Curricular Activities

Aug'19 - May'20 **Editor in Chief, Hindi Editorial Board**

Punjab Engineering College, Chandigarh, India

- Responsible for designing the college Magazine PECPost
- Responsible for organizing various cultural activities in college

Aug'16 - May'20 **Volunteer, National Service Scheme**

Punjab Engineering College, Chandigarh, India

- Taught underprivileged students, Tree plantation and Organized Blood Donation Camps

2014 - 2020 **Spokesperson and Student President**

Rashtriya Arya Nirmatri Sabha (RANS), India

- Organized Camps for creating awareness about drug abuse and superstitious beliefs