

UTKARSH AASHU MISHRA

PERSONAL INFORMATION

ADDRESS: BG-03, Jawahar Bhawan, Indian Institute of Technology, Roorkee
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EDUCATION

2017 - PRESENT Bachelors of Technology in MECHANICAL ENGINEERING
Indian Institute of Technology(IIT), Roorkee, India
CGPA: 9.031/10.0 | [Transcripts](#)

INTERESTS

Robotics, Autonomous Vehicles, Optimal Control, Reinforcement Learning

BACHELOR THESIS

ONGOING SEP 2020	Learning Control Policies for Imitating Human Gaits Collaboration: EPFL Biorobotics Laboratory Primary Supervisor: Prof. Dr. Pushparaj M. Pathak , MIED, IITR Co - Supervisor: Prof. Dr. Auke J. Ijspeert , Biorobotics Laboratory, EPFL Simulating Healthy Movements using Predictive Simulation and developing Robust Control Policies using Deep Reinforcement Learning to effectively control a full body skeletal model and achieve the desired gait. Intro Video
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INTERNSHIPS

ONGOING JUL 2020	Structural Stability based Motion Planning for Cable Driven Parallel Robots Supervisor: Dr. Stéphane Caro , ROMAS-LS2N, France Motion Planning of Suspended cable Robots in Cluttered Environments Implemented modified RRT* with an Artificial Field Guide and GJK collision detection Publication Submitted. Paper
JUL 2020 APR 2020	Behavioral Planning for Autonomous Vehicles using Reinforcement Learning Reinforcement Learning Intern at Swaayatt Robots , India Worked on constructing observation, states and action space for Behavioral Planning DRL framework coupled with a probabilistic local planner and PD controller Conducted experiments with DQN, DDPG, TRPO and PPO algorithms on Carla Self-Driving Simulator with ROS Bridge. More Information

RESEARCH EXPERIENCE (UNPUBLISHED)

ONGOING JAN 2020	<p>Trajectory Planning and Tracking for Toe-Foot Bipedal Robot Model Computer Science and Engineering Department, IIT Roorkee, India Under-Review: Neural Computing and Applications Paper Accepted: Robotics and Artificial Intelligence (ROAI) 2020 Paper Working on a 9-DOF Toe-Foot Robot Model, developed Unsupervised Inverse Kinematics and Dynamic Equations for modelling. Novel Trajectory planning strategies are explored and Optimal Tracking controller is developed</p>
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RESEARCH PUBLICATIONS [C] - CONFERENCE [J] - JOURNAL

- [C] SEP 2020 U. A. Mishra, I. Chawla and P. M. Pathak, "On Determining Shortest Path in Joint Space of a Cable-Driven Parallel Robot for Point-to-Point Motion," 2020 28th Mediterranean Conference on Control and Automation (MED), Saint-Raphaël, France, 2020, pp. 984-989, doi: [10.1109/MED48518.2020.9183198](https://doi.org/10.1109/MED48518.2020.9183198). [Paper](#)
- [C] SEP 2020 Soni, B, Mishra, UA, & Nayak, AK. "Optimal Control Strategy to Distribute Water Through Loop-Like Planar Networks." Proceedings of the ASME 2020 Fluids Engineering Division Summer Meeting, Volume 2: Fluid Mechanics; Multiphase Flows. Virtual, Online. July 13–15, 2020. V002T03A025. ASME. <https://doi.org/10.1115/FEDSM2020-20097>. [Paper](#)
- [C] SEP 2020 Mishra, UA, & Bansal, A. "Quasi-Photon Monte Carlo on Radiative Heat Transfer: An Importance Sampling Approach." Proceedings of the ASME 2020 Heat Transfer Summer Conference. Virtual, Online. July 13–15, 2020. V001T02A012. ASME. <https://doi.org/10.1115/HT2020-8950>. [Paper](#)

TEAM PROJECTS

OCT 2020 SEP 2020	<p>Analyse the mental health of India during COVID Group Project for Spotle AIthon 2020 Ranked 5th among 7342 Participants in Spotle AI-thon 2020. Certificate Classified Mood based on grayscale facial expression images by using VGG-like architecture Multinomial NB model was used along with TfIdf Vectorizer to train the model with a stratified Cross-validation Strategy</p>
AUG 2020 JUL 2020	<p>Design, Simulation and Motion Planning for Quadrotor Group Project for Flipkart GRID 4.0 Designing and Structural Analysis, followed by proper URDF modelling Integrated sensors and stereo-camera based localization and mapping using RTabMap Dynamic Modelling is done and appropriate probabilistic conformal lattice based planner is formulated More Information</p>
PRESENT JAN 2018	<p>IIT Roorkee Motorsports Electric 2019 (RMSE'19) FS Prototype IIT Roorkee Motorsports , Formula Student Team of IIT Roorkee Experience of Designing and Fabricating an Electric Vehicle from scratch. Manufactured RMSE'19 Formula Electric Prototype As a member of the Autonomous Algorithms Subsystem, dedicated to vision-based Localization, Mapping and motion planning for our upcoming proposed vehicle</p>

KEY COURSES

2020	Robotics and Control (Cur.)	Vibration and Noise (9/10)
	Dynamics of Mechanical Systems (Cur.)	Machine Drawing (10/10)
	Automatic Control (8/10)	2018 Engineering Analysis and Design (8/10)
	Machine Design (9/10)	Kinematics of Machines (9/10)
2019	Dynamics of Machines (10/10)	Numerical Methods (10/10)
		2017 Programming and Data Structures (10/10)

SKILLS

Programming: C++, PYTHON, TENSORFLOW,
Softwares: ROS, Gazebo, MATLAB, SIMULINK, OPENSIM, VISUAL STUDIO, SOLIDWORKS,
ANSYS (Design, Meshing, Structural, Fluent)
Others: Linux(UBUNTU), L^AT_EX

AWARDS AND ACHIEVEMENTS

JAN 2020	Secured Second Runners Up position in Formula Green 2020 with IIT Roorkee Motorsports
MAY 2019	Selected for the SPARK Research Internship Program by IIT Roorkee (Certificate)
MAY 2017	Joint Entrance Examination, Advanced (Indian Institute of Technology) All India Rank 2223, 98.99 percentile
MAY 2017	Awarded the prestigious KVPY Scholarship (Kishore Vaigyanik Protsahan Yojana) in-stream SX (2016) (Certificate)
MAY 2017	Achieved Merit Certificate in Physical Education in the CBSE AISSCE 2017 (Standard 12) (top 0.1% of examinees)(Certificate)

POSITION OF RESPONSIBILITIES

CURRENT	Aerodynamic SubSystem head at IIT Roorkee Motorsports
JAN 2019	Undergraduate Teaching Assistant, Academic Reinforcement Program, Teaching Assistant for the course MAN-004 Numerical Methods.
DEC 2018	Developer and WoC Mentor at Mobile Development Group, IIT Roorkee
AUG 2017	National Cadet Corps, 3UK NCC IIT Roorkee, India Successfully gave the Guard of Honour to our Institute's Director on the occasion of Independence Day

REFERENCES

Dr. Stéphane Caro
CNRS Research Director
Team Leader: ROMAS.
Nantes Laboratory of Digital Sciences
France
Stephane.Caro@ls2n.fr

Dr. N. Sukavanam
Professor, Head of Department
Mathematics Department
Indian Institute of Technology Roorkee
India
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INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

OFFICIAL TRANSCRIPT

(Statement of Earned Credits & Grades)



ENROLLMENT NO. OF THE STUDENT: 17117093
PROGRAMME: BACHELOR OF TECHNOLOGY (MECHANICAL)

NAME: UTKARSH AASHU MISHRA

SESSION	2017-18	SEMESTER	Autumn	GRADE LETTER	GRADE POINT	CREDIT
SUBJECT CODE	SUBJECT TITLE					
CEN-105	INTRODUCTION TO ENVIRONMENTAL STUDIES			B+	9	3
HSN-001A	COMMUNICATION SKILLS (BASIC)			B+	9	2
HSN-002	ETHICS AND SELF AWARENESS			A	10	2
MAN-001	MATHEMATICS-I			B+	9	4
MIN-101A	INTRODUCTION TO MECHANICAL ENGINEERING			A	10	2
MIN-103	PROGRAMMING AND DATA STRUCTURES			A	10	4
PHN-001	MECHANICS			B+	9	4
EARNED CREDITS	21	TOTAL EARNED CREDITS	21	SGPA	9.381	
REG. CREDITS	21			CGPA	9.381	

SESSION	2017-18	SEMESTER	Spring	GRADE LETTER	GRADE POINT	CREDIT
SUBJECT CODE	SUBJECT TITLE					
MAN-004	NUMERICAL METHODS			A	10	4
MIN-104	MANUFACTURING TECHNOLOGY-I			B	8	4
MIN-106	ENGINEERING THERMODYNAMICS			B+	9	4
MIN-108	MECHANICAL ENGINEERING DRAWING			A	10	4
MTN-106	MATERIAL SCIENCE			C+	7	4
PHN-008	ELECTROMAGNETIC THEORY			B+	9	4
PR-501	N.C.C.			B+	9	2
EARNED CREDITS	26	TOTAL EARNED CREDITS	47	SGPA	8.846	
REG. CREDITS	26			CGPA	9.085	

SESSION	2018-19	SEMESTER	Autumn	GRADE LETTER	GRADE POINT	CREDIT
SUBJECT CODE	SUBJECT TITLE					
CEN-102	SOLID MECHANICS			B+	9	4
MIN-201	KINEMATICS OF MACHINES			B+	9	4
MIN-203	MANUFACTURING TECHNOLOGY-II			A	10	4
MIN-205	FLUID MECHANICS			B	8	4
MIN-291	ENGINEERING ANALYSIS AND DESIGN			B	8	4
EARNED CREDITS	20	TOTAL EARNED CREDITS	67	SGPA	8.800	
REG. CREDITS	20			CGPA	9.000	

SESSION	2018-19	SEMESTER	Spring	GRADE LETTER	GRADE POINT	CREDIT
SUBJECT CODE	SUBJECT TITLE					
EEN-112	ELECTRICAL SCIENCE			B+	9	4
HSS-01	ECONOMICS			B+	9	3
MIN-204	MACHINE DRAWING			A	10	4
MIN-206	MECHANICS OF MATERIALS			B+	9	4
MIN-208	THEORY OF PRODUCTION PROCESSES			B+	9	4
MIN-210	ENERGY CONVERSION			B+	9	4
EARNED CREDITS	23	TOTAL EARNED CREDITS	90	SGPA	9.174	
REG. CREDITS	23			CGPA	9.044	

SESSION	2019-20	SEMESTER	Autumn	GRADE LETTER	GRADE POINT	CREDIT
SUBJECT CODE	SUBJECT TITLE					
IBM-306	MARKETING RESEARCH			B+	9	3
MIN-301	DYNAMICS OF MACHINES			A	10	4
MIN-303	PRINCIPLES OF INDUSTRIAL ENGINEERING			B+	9	4
MIN-305	HEAT AND MASS TRANSFER			B+	9	4
MIN-321	VIBRATION AND NOISE			B+	9	4





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ENROLLMENT NO. OF THE STUDENT: 17117093

NAME: UTKARSH AASHU MISHRA

PROGRAMME: BACHELOR OF TECHNOLOGY (MECHANICAL)

MIN-391	TECHNICAL COMMUNICATION	C+	7	2
EARNED CREDITS	21	TOTAL EARNED CREDITS	111	SGPA 9.000
REG. CREDITS	21			CGPA 9.036

SESSION	2019-20	SEMESTER	Spring	(Covid-19)	GRADE LETTER	GRADE POINT	CREDIT
SUBJECT CODE	SUBJECT TITLE						
IPH-305	QUANTUM COMPUTING				S	-	3
MIN-300	LAB BASED PROJECT				A	10	4
MIN-302	MACHINE DESIGN				B+	9	6
MIN-304	FLUID MACHINERY				B+	9	4
MIN-354	AUTOMATIC CONTROL				B	8	4
EARNED CREDITS	21	TOTAL EARNED CREDITS	132		SGPA	9.000	
REG. CREDITS	21				CGPA	9.031	

STUDENT HAS NOT YET COMPLETED THE PROGRAMME

Note:-

- 1) The medium of Instruction at this Institute is English.
- 2) Academic Performance is graded on a 10-Point Scale.
- 3) "S"-Grade: Satisfactory performance during Covid-19 pandemic.

Place: Roorkee

Dated: 10/13/2020




Assistant Registrar (Evaluation)