Résumé
Utkarsh Aashu Mishra

EDUCATION

INDIAN INSTITUTE OF TECHNOLOGY (IIT) ROORKEE

BTech in Mechanical Engineering
Expected May 2021 | Roorkee, India
Cum. GPA: 9.031/10
Transcripts

LINKS

Email: umishra@me.iitr.ac.in
Portfolio:// www.umishra.live
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Github:// utkarshmishra04
LinkedIn:// utkarshamishra

COURSEWORK

UNDERGRADUATE

Robotics and Control (Cur.)
Dynamics of Mechanical Systems (Cur.)
Automatic Control (8/10)
Machine Design (9/10)
Numerical Methods (10/10)
Electromagnetic Theory (9/10)
Programming and Data Structures (10/10)

INTERESTS

Robotics
Autonomous Vehicles
Optimal Control
Reinforcement Learning

SKILLS

PROGRAMMING

Languages:
C++ • Python • Matlab • LaTeX
Softwares:
ROS • Gazebo • Matlab-Simulink • OpenSim • SCONE • PyBullet • Solidworks • Ansys
Frameworks:
Tensorflow • Pytorch
OS:
Linux(Ubuntu) • Windows

BACHELOR THESIS

EPFL BIOROBOTICS LABORATORY | Thesis Collaboration

September 2020 – Present | Switzerland, Remote (Covid'19)
Primary Supervisor: Prof. Dr. Pushparaj M. Pathak, MIED, IIT Roorkee
Co-Supervisor: Prof. Dr. Auke Ijspeert, Biorobotics Laboratory, EPFL

- Collaborating with Dr. Dimitar Stanev and simulating Healthy Movements using Predictive Simulation
- Developing Robust Control Policies using Deep Reinforcement Learning to effectively control a full body skeletal model and achieve the desired gait.
- Intro Video

EXPERIENCE

SWAAYATT ROBOTS | Reinforcement Learning Intern

April 2020 – July 2020 | India, Remote (Covid'19) | More Information

- Constructed Observation, States and Environment for Behavioral Planning DRL framework using the Perception Stack (Lidar, Camera)
- Conducted experiments with DDPG and PPO algorithms for velocity prediction agent
- Simulated on Carla Simulator with ROS Bridge based on offline collecetd data

SPARK FELLOWSHIP | Undergraduate Research Intern

May 2019 – July 2019 | IIT Roorkee, India

- Published: ASME Summer Heat Transfer Conference (SHTC 2020)
- Worked under the guidance of Dr. Ankit Bansal on Quasi Photon Monte Carlo Method along with Importance Sampling technique and its application to radiative heat transfer.

RESEARCH | UNPUBLISHED

NANTES LABORATORY OF DIGITAL SCIENCES | Collaborator

May 2020 – Present | France, Remote (Covid'19)

- Working with the RoMaS team under the guidance of Dr. Stéphane Caro.
- Worked with path planning of a Cable Driven Parallel Robot in complex obstacle-cluttered environments under objectives of Maximizing Stability and Manipulability.
- Publication submitted. Article Video

MATHEMATICS DEPARTMENT | Robotics Project Student

Jan 2020 – Present | IIT Roorkee

- Working on a 9-DOF Toe-Foot Robot Model under guidance of Prof Dr. N. Sukavanam.
- Developed Unsupervised Inverse Kinematics, Novel Trajectory planning strategies and an Optimal Tracking controller.
- Publication Accepted: Robotics and Artificial Intelligence (ROAI) 2020, Proceedings: Journal of Physics Article
- Under Review: Springer Neural Computing and Applications Article

REFERENCES

DR. STÉPHANE CARO
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DR. N. SUKAVANAM
Professor, Head of Department
Mathematics Department
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DR. PUSHPARAJ M. PATHAK
Professor
Mechanical Engineering Department
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PUBLICATION | [C] - CONFERENCE [J] - JOURNAL

[C] 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**. Article

[C] 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. **doi: https://doi.org/10.1115/FEDSM2020-20097**. Article

[C] 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. **doi: https://doi.org/10.1115/HT2020-8950**. Article

TEAM PROJECTS

IIT ROORKEE MOTORSPORTS | Formula Student Electric

IITR Motorsports Electric 2019 (RMSE'19) FS Prototype | Jan. 2018 – Present

- Aerodynamics System Lead, Role: Aerodynamic Optimization, Sponsor Meetings, Training juniors
- Experience of Designing and Fabricating an Electric Vehicle from scratch. Manufactured RMSE'19 Formula Electric Prototype
- Member of Autonomous Algorithms Subsystem, formulating SLAM base for autonomous endeavors in future

SPOTLE AI-THON 2020 | Spotle.ai Data Science Project

Analyse the mental health of India during COVID | Sept. 2020 – Oct. 2020

- Ranked 5 th among 7342 Participants. 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

FLIPKART GRID 4.0 2020 | Robotics Project

Design, Simulation and Motion Planning for Quadrotor | Jul. 2020 – Sept. 2020

- 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 probablistic conformal lattice based planner is formulated Presentation Video

AWARDS

2020 Secured 3rd position in 5th Formula Green 2020 with IIT Roorkee Motorsports
2019 Selected for the SPARK Research Fellowship Program by IIT Roorkee
2017 All India Rank **2223**, **99.72 %ile** in Joint Entrance Examination Advanced(IITJEE)
2017 Awarded the prestigious KVPY Scholarship (Kishore Vaigyanik Protsahan Yojana) in-stream SX (2016) (All India Rank **780**, **99.48 %ile**)

POSITION OF RESPONSIBILITIES

Present Aerodynamics Head and Autonomous Team member at IITR Motorsports
2018 Undergraduate Teaching Assistant, Academic Reinforcement Program, Teaching Assistant for MAN-004 Numerical Methods
2018 Developer and WoC Mentor at Mobile Development Group, IIT Roorkee

Note: Refer to Underlined Links for More Information