RAKTIM GAUTAM GOSWAMI

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Curriculum Vitae

EDUCATION

New York University, Tandon School of Engineering September 2021 - Present
Ph.D. in Electrical Engineering, **GPA : 4.0/4.0**

Indian Institute of Technology (IIT), Hyderabad July 2017 - May 2021
Bachelor of technology in Electrical Engineering, **GPA : 9.11/10**
Bachelor of technology in Computer Science and Engineering [1]. **GPA: 8.5/10**

Faculty Higher Secondary school, Guwahati, Assam March 2017
CBSE:Class XII, **97.2**%

Faculty Higher Secondary school, Guwahati, Assam March 2015
CBSE:Class X, **GPA: 10/10**

MAJOR PROJECTS AND EXPERIENCE

Efficient Real-Time Localization in Prior Indoor Maps Using Semantic SLAM January 2022 - Present
Prof. Farshad Khorrami
A methodology for real-time global localization (registration) of an agent (robot or visually impaired person) in the presence of an *a priori* indoor map (e.g., an image of a floor plan) is developed. The SLAM map created by the agent equipped with RGB-D and IMU sensors is used in conjunction with an *a priori* architectural floor plan to find the global location of the agent. *Paper under review at ICARA 2023.*

Data-driven deep learning based Feedback Linearization of systems with
Unknown Dynamics September 2021 - Present
Prof. Farshad Khorrami
A methodology is developed to learn a feedback linearization (i.e., nonlinear change of coordinates and input transformation) using a data-driven approach for a nonlinear system with unknown dynamics. We employ deep neural networks to learn the feedback law (input transformation) in conjunction with an extension of invertible neural networks to learn the nonlinear change of coordinates (state transformation). We also learn the matrices A and B of the transformed linear system and define loss terms to ensure controllability of the pair (A, B). *Paper under review at ACC 2023.*

Speech enhancement using Deep Learning May 2019 - May 2021
Dr. K Sri Rama Murty, Department of Electrical Engineering, IIT Hyderabad
The frequency representation of Speech signals is in the complex domain. However, the majority of current speech enhancement algorithms only work on enhancing (removing the noise from) the magnitude of this complex-valued representation and use the noisy phase as it is. We have developed several deep learning based methods that enhance magnitude as well as phase of the complex-valued representation of the speech. (A pre-print of one of the methods can be found here: arXiv:2010.14122)

Intern as AI/Robotics Engineer November 2018 - February 2019
Crystalball
I worked on the implementation of precision agriculture using pre-trained computer vision models on aerial images taken by Unmanned Aerial Vehicles(UAVs). Additionally, I helped in the designing and building of these UAVs.

Intern as Software Developer June 2020 - July 2020
Honeywell Connected Enterprise
All aircraft and helicopters need to communicate with the ground station while they are cruising in the sky. I contributed to developing the software part for a Honeywell product that would make this communication easy.

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[1] IITH provides the option of pursuing two B.Tech majors simultaneously by completing some additional credits in the second major. Link for reference

PUBLICATIONS

A list of all my publications can be found here.

TECHNICAL SKILLS

Programming Languages/Softwares	Python, C, C++, MATLAB, LaTeX, ROS
ML Frameworks	Keras, Tensorflow, Pytorch, Scikit-learn
Hardware	Arduino, Raspberry PI, Pixhawk

ACADEMIC AWARDS AND ACHIEVEMENTS

Certificate of Academic Excellence
Awarded by IIT Hyderabad for **outstanding academic performance** in the Aug-Dec 2017 semester.

Simon Kachari Award
Awarded by Faculty H.S. School, for **All round best student of the school** for the year **2016-2017**

CO-CURRICULAR

Science and Technology Secretary   May 2019 - August 2020
Student Gymkhana (Student Council), IIT Hyderabad

- Under my tenure, IIT Hyderabad won its highest ever medal tally of **3 silver medals**, and **1 bronze medal** in the Inter-IIT tech meet 2019 held at IIT Roorkee.

Coordinator   May 2018 - April 2019
Robotics Club, IIT Hyderabad

- Under my tenur, the Robotics club was awarded the **best technical club of IITH**.

Student Mentor   May 2018 - April 2019
Sunshine Counselling Cell, IIT Hyderabad

Marketing Coordinator   May 2018 - April 2019
Elan & Nvision, Annual Techno-cultural Fest, IIT Hyderabad