SNEHAL SINGH TOMAR

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Education

- **Indian Institute of Technology Madras** — Chennai, India
  M.S. in Electrical Engineering — *August, 2020 - Present*
- **Manipal Institute of Technology** — Manipal, India
  B.Tech. in ECE, Minor in Signal Processing; CGPA: 8.42/10.0 — *2016 - 2020*

Publications

- Tomar S.S., Narendra V.G. (2019) Python-Based Fuzzy Classifier for Cashew Kernels. In: Bansal J., Das K., Nagar A., Deep K., Ojha A. (eds) Soft Computing for Problem Solving. Advances in Intelligent Systems and Computing, vol 816. Springer, Singapore. This paper was awarded the **Best Paper Award** at the 7^{th} International Conference on Soft Computing for Problem Solving(2017) held at IIT Bhubaneswar.

Research Internships

- **Indian Institute of Technology Delhi** — Prof. Shubhendu Bhasin
  B.Tech Project — *January, 2020 - May, 2020*
  - **Project Title**: *Implementation of Torque-Based Position Control for Trajectory Tracing by a Five DOF Robotic Manipulator*
  - Tele-Operated the ROBOTIS Open Manipulator-X in position control mode using its ROS packages
  - Developed a Torque-Based Position Controllerfor the Open Manipulator
  - Simulated and tested the controller in Gazebo
- **Indian Institute of Technology Delhi** — Prof. Shubhendu Bhasin
  Global Internship Programme in Engineering Design and Innovation — *May, 2019 - July, 2019*
  - **Project Title**: *Torque Transformer for Position Controlled Robotic Joints*
  - Worked towards deployment of Torque Control on Robotic Joints which were governed by position-controlled servo motors, using a torque-position transformer approach.
- **Indian Institute of Technology Delhi** — Prof. Shubhendu Bhasin
  Global Internship Programme in Engineering Design and Innovation — *May, 2018 - July, 2018*
  - **Project Title**: *Real Time Target Detection in Aerial Video Feed Using Deep Convolutional Neural Networks*
  - Implemented the **YOLO** (You Only Look Once) Deep Convolutional Neural Network using Tensorflow's low-level APIs and analyzed its performance on the *Stanford Drone Dataset*
  - Applied Geometric Image Transformations to the training Images and studied the improvements in performance with respect to precision and IOU
- **Indian Institute of Technology Delhi** — Prof. Shubhendu Bhasin
  Winter Project — *December 2017*
  - **Project Title**: Error Characterization of *Opti-Track Motion Capture System*
  - Studied the IR camera based Motion Capture System installed in the Digital Control Laboratory, Department of Electrical Engineering, IIT Delhi and characterized the error in position of the objects tracked by it
  - Predicted expected error in position for larger capture volumes with appropriate mathematical analysis
  - Proposed an optimal IR camera set-up for a dedicated motion capture laboratory

Key Projects

- **Mobile Application for OCD Diagnosis** — Kasturba Medical College, Manipal
  iOS application development — *January,2019 - April,2019*
  - Developed an iOS application called *unzapp!* which helps in early diagnosis of OCD amongst college students.
  - The app administers an OCD-screening questionnaire to users. This questionnaire was prepared under the mentorship of Prof. PSVN Sharma, Department of Psychiatry, KMC, Manipal.
- **Wireless Communication Architecture for an Autonomous robot** — Project MANAS*
  Antenna Theory, Embedded Systems — *January, 2018 - March,2018*
  - Worked on development of a wireless communication system comprising of microcontrollers, RFmodules and antennae for communication between a computing system and an autonomousrobot.
  - This was a part of Project Manas' entry to International Ground Vehicle Challenge (IGVC)-2018 held at Michigan, USA; where the team stood second in the Inter-Operability Challenge and ninth overall.
- **Fuzzy Controller for an Autonomous Car** — Project MANAS*
  Soft Computing, Control Theory — *August, 2017 - October,2017*
  - Developed a standalone fuzzy throttle v/s break controller on the lines of a traditional Mamdani Controller and linked it with ROS framework for control of an electric vehicle.
  - The controller performed well on planes, inclines and turns during tests.

Scholastic Higlights

- GATE(EC) *2020*| score: 608/1000, All India Rank: 1927
- GRE General Test Score:- Quantitative and Verbal Ability: 320/340 | Analytical Writing: 3.5/6
- Awarded Research Incentive and Certificate of Appreciation in October, 2018 by Manipal Academy of Higher Education (MAHE) for producing award winning research work
- Obtained a percentile score of 98.62 among 1.3 million Indian High School Students in the IIT JEE (Advanced), 2016
- Cleared National Talent Search Examination (Stage-I), conducted by National Council of Educational Research and Training (NCERT) from Uttar Pradesh in 2011
- Secured All India Rank-55 in Unified Cyber Olympiad, 2008
- Secured All India Rank-35 in National Cyber Olympiad, 2008
- Secured All India Rank-11 in National Cyber Olympiad, 2006

Proficiencies & Skills

- **Programming Languages**: C++, Python, HTML/CSS, Verilog(HDL)
- **Software and Frameworks**: Swift(Xcode), OpenCV, Tensorflow, ROS, Scikit-Fuzzy, MATLAB, Autodesk-Eagle

Courses Undertaken

Problem Solving Using Computers, Programming in JAVA, iOS application development, Linear Algebra, Advanced Digital Signal Processing, Digital Signal Processing, Image Processing, Speech Processing, Communication Systems, Signals and Systems, Linear and Digital Control Systems, VLSI design, Digital System Design,*Machine Learning Crash Course by GOOGLE*

Extra-Curricular

Member, Sensing and Automation division(*February, 2017 to March, 2019*) of **Project MANAS*** (www.projectmanas.in). Project Manas is the official AI Robotics Student Team of Manipal Academy of Higher Education(MAHE), Manipal. The team's key focus is development of a Autonomous car and is a part of the *Mahindra Rise Prize Challenge*, which is India's first Autonomous Car Competion.