SHASHI KANT GUPTA

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EDUCATION

Indian Institute of Technology, Kanpur, India
Major in Electrical Engineering with Minor in Cognitive Science — *Aug. '16 – Jun. '20*
GPA: 8.88/10.0 *(Four Semesters)* — *(Expected)*

Munam Public School, Hazaribagh, India
Intermediate
Percentage: 91.2% — *April 2016*

DAV Public School, Hazaribagh, India
Matriculation
GPA: 10.0/10.0 — *April 2014*

ACADEMICS ACCOLADES

- Received **Academic Excellence Award** twice for outstanding academic performance (awarded to top 7% of students in the institute) for the year 2016 and 2016-17
- **99.89 percentile** in Joint Entrance Examination (**IIT-JEE 2016)** among 1.5 million students.
- Secured **All India Rank 842** in **KVPY 2015,** a fellowship exam conducted by IISc Bangalore and funded by Department of Science and Technology, Govt. of India

INTERESTS

Artificial Intelligence • Cognitive Science • Computer Vision • Machine Learning • Signal Processing

RESEARCH PROJECTS

Distance Measurement Module for Localisation of UAVs in Deep Tunnel — *Jun. '18 – Jul. '18*
Summer Internship, Dr Hock Beng Lim, Centre for Smart System, SUTD Singapore

- Worked on the **Optical Flow** algorithm based on **SAD block matching** to determine UAV position in deep tunnels i.e. GPS denied environment (coded in python, for actual prototype **PX4FLOW** was used)
- Developed a self-prediction based algorithm to correct the error (due to inconsistent flow) in the calculation
- Performed various experiments to collect data samples to measure and analyse performance
- Worked on implementing **Extended Kalman Filter** to use acceleration data to improve accuracy during less illumination.

Humanoid IITK — *Dec. '16 – Ongoing*
Dean of Research and Development Project, Dr Ashish Dutta, IIT Kanpur

- Designed and developed **Institute's first Humanoid (AUTOMI)**, which can perform **statically stable biped walking**, **voice localisation**, various computer vision tasks like **object tracking**, **line following**
- Integrated all the packages and modules using the **ROS** platform
- Designed a GUI to control and debug the robot using **PyGTK** and **Glade** for Linux platform
- Worked on developing the **bipedal walking algorithm** using **ZMP** for the stability criteria
- Worked on **Object Tracking** using various computer vision algorithms in OpenCV

OTHER RELEVANT PROJECTS

How Close are Artificial Neural Networks to the Brain? — *Sep. '18 - Ongoing*
CS771A - Machine Learning, Prof Piyush Rai, IITK

- Studying different types of **ANN** models to compare their structure and performance.

Cooperative Localization Using Posterior Linearization Belief Propagation — *Sep. '18 - Ongoing*
EE602A – Statistical Signal Processing, Prof R. M. Hegde, IITK

- Implementation of a research paper, which presents the posterior linearization belief propagation (PLBP) algorithm for cooperative localization in wireless sensor networks with nonlinear measurements.

Achieving Cramer–Rao Lower Bounds in Sensor Network Estimation — *Sep. '18 - Ongoing*
EE602A – Statistical Signal Processing, Prof R. M. Hegde, IITK

- Implementation of a research paper, which proposes a general framework for comparison of estimation strategies in sensor networks with achievable bounds.

PixhawkArduinoMAVLink — *Jun. '18 – Ongoing*
Self Project

- Developed an Open Source Arduino library to communicate between Pixhawk and Arduino
- Using **MAVLink** messaging protocol to create the communication

SL-COM (Sign Language Communication) — *Mar. '17*
Robotics Club, IIT Kanpur

- Developed **customized sign language** & utilized it to generate **hand gestures** for each alphabet to help dumb and deaf people

- Used Bluetooth Module to send mapped texts to a Chat-App (based on nodeJS) using **ROS** as the platform for integration, conversion of text to speech using speech to text API
- Demonstrated the prototype in **Techkriti Innovation Challenge** and was awarded the **3rd prize**

RELEVANT COURSES

- Computer Vision: Foundations and Applications (Stanford AI) [#]
- Probability and Statistic
- Data Structures & Algorithms
- Fundamental of Computing [*]
- Signals, Systems And Networks
- Control Systems and Analysis
- Linear Algebra
- Introduction to Machine Learning [o]
- Statistical Signal Processing [o]
- Foundation of Cognitive Science [o]
- CNN for Visual Recognition (Stanford AI) [#][o]
- Deep Learning Specialization (deeplearning.ai) [#][o]
- Natural Language Processing [!]
- Computational Cognitive Science [!]

** - Exceptional Performance* *! - To Be Taken in Upcomming Semester* *# - Online (Audit)* *o - Ongoing*

TECHNICAL SKILLS

Languages: C • Python • Matlab • JavaScript

Software and Tools: OpenCV • NumPy • ROS (Robot OS) • Git • Arduino • HTML/CSS • Jekyll • TensorFlow [Keras] (Basic Ex.)

TECHNICAL & ACADEMIC ACTIVITIES

Students Project Coordinator *Sep. '18 - Present*
Electrical Engineering Association, Dept. of Electrical Engineering, IIT Kanpur
- Will be looking after to provide and manage projects for the undergraduates in the department

Technical Head *May. '18 - Present*
Humanoid IITK Team, IIT Kanpur
- Leading a team of 10 members to develop our fully functional **Humanoid**
- Overseeing various technical aspects and future goals of the project

UG Coordinator *Aug. '17 – Aug. '18*
Electrical Engineering Association, Dept. of Electrical Engineering, IIT Kanpur
- Provided support and guidance to undergraduates to create a link between faculty and students

Secretary *Apr. '17 – Mar. '18*
Robotics Club, IIT Kanpur
- Delivered a lecture on **ROS** for the campus junta in my very first year (only first year to get this opportunity)
- Designed the Robotics Club website using **Jekyll** and **Material Design Framework**

EXTRA CURRICULAR ACTIVITIES

Secretary *Apr. '17 – Mar. '18*
Fine Art Club, IIT Kanpur
- Performed various stage performance for the club
- Worked on a very new idea of using kirigami as a **SpeedArt** performance and successfully mentored 3 freshmen to perform it on stage in just 2.5 mins!

Student Guide *Aug. '17 – Jul. '18*
Counselling Service, IIT Kanpur
- Helped 6 freshmen adjust to campus life on their arrival to campus
- Provided emotional support and academic guidance to them during their first year

Student Volunteer *Aug. '16 – May. '17*
NSS, IIT Kanpur
- Conducted survey and workshop in a nearby village (Nankari) to collect poor and underprivileged children to provide educational facilities to them, regularly visited there to teach them.