Mayank Mishra

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Academic Qualifications

Year	Degree/Certificate	Institute	CGPA / %
2016 - Present	B.Tech in Electrical Engineering (Power & Automation)	Indian Institute of Technology Delhi	8.302/10.0
2016	CBSE (XII)	Delhi Public School Indirapuram	94.0%
2014	CBSE (X)	Delhi Public School Indirapuram	10.0/10.0

Scholastic Achievements

- Secured All India Rank 921 in JEE Advanced 2016
- Secured All India Rank 682 in JEE Mains 2016
- Secured Department rank 3 at the end of first year B.Tech

Internship

- Currently an intern at SAMSUNG Research Institute Noida
- Working on automatic code porting across operating systems for faster code porting and minimizing the need for human involvement as much as possible.

Academic Projects

1. **Adversarial approximate inference for speech to laryngograph conversion (*Prof. Prathosh AP*)**
   [Sep, 2018 - present]
   - Optimized the speech to laryngograph encoder using adversarial training for the network.
   - Created a cosine based loss function for enforcing amplitude invariance between ground truth and network output.
   - Used a variational inference approach for learning optimal representations for the speech signal.
   - Utilized continuous wavelet transforms using Ricker wavelets for robust peak picking.

   To be submitted to **IEEE TASLP** (*IEEE Transactions on Audio, Speech and Language Processing*)

2. **Touch-Point Prediction using Deep Learning *(Professor Brejesh Lall)*** **[May, 2018 - present]**
   - Working on improving touch-screen latency in collaboration with SAMSUNG on SAMSUNG Flip device.
   - Trained fully-connected, Recurrent Neural Networks (RNNs) and Long-Short Term Memory (LSTM) networks, analyzed the performance of these algorithms.
   - Proved that touch point prediction using the said algorithms worked better than simple extrapolation.
   - Performed an extensive literature survey of various algorithms and implemented the algorithms with data augmentation.
   - Trained the models using Tensorflow framework.

3. Braille Tutoring Application *(Professor M. Balakrishnan)* **[Jan, 2018 - May, 2018]**

- Implemented tutorials and games using Python for visually challenged students to learn Braille.
- Created Linux based secondary software to add customized exercises or games in the application.
- Application runs on a Beaglebone based Refreshable Braille Device.
- Worked on providing tactile output, sound and an external Arduino based serial LCD display through the RBD.
- Received appreciation in Open House 2018 at IIT Delhi.

4. Recognizing Numbers in Sign Language **[Mar, 2018]**

- Trained deep learning model to recognize the number represented by hand gestures in sign language.
- Trained residual network (ResNet50) and non-residual (CNN) for the problem.
- Trained the model using Tensorflow on the Sign Language Digits Dataset from Kaggle.

5. First Person Shooter Game **[Dec, 2017 - Jan, 2018]**

- Created a single-player shooter game using Unreal Engine 4 with C++ and graphical scripting.
- Modelling and animations done on Autodesk 3ds Max.
- Implemented as a self project for Microsoft code.fun.do.

6. Identifying the Diabetic Neuropathic Patients using Machine Learning **[Nov, 2017 - Dec, 2017]** ***(Professor Tapan Gandhi)***

- Implemented a machine learning SVM classifier using foot-pressure data on labeled training set.
- Implemented k-means clustering algorithm on unlabeled training set.
- Implemented a WPF software in C# to record data using an Arduino based pressure mat.

7. BTree with Duplicate keys *(Professor Mausam)* **[Oct, 2017]**

- Implemented the BTree data structure used for indexing of large databases.
- Modified the search, insert and delete algorithms for compatibility with duplicate keys in the tree.

8. Greyscale Image Compression *(Professor Mausam)* **[Sept, 2017]**

- Implemented sparse matrix representation for greyscale images using doubly-linked lists for compression.
- Implemented the INVERT, AND, OR and XOR without uncompressing the images.

9. Crystal Ball Interface to View 3D Objects *(Professor Subodh Kumar)* **[Sept, 2016 - Nov, 2016]**

- Implemented a crystal ball interface using OpenGL in C++ for viewing 3D objects saved in .obj file format.

Courses completed

- **Computer Science:**
  - Machine learning (ongoing) & Computer architecture (ongoing)
  - Data structures and algorithms
  - Embedded systems design project
  - Machine learning
  - Advanced machine learning
  - Computer architecture
- **Mathematics:** Linear algebra and differential equations, Calculus, Probability and stochastic processes

- **Electrical:** Signals and systems, Digital electronics
- **Online Certification:**
  - Machine learning (Stanford)
  - 5-course deep learning specialization (deeplearning.ai)
  - 4-course machine learning specialization (University of Washington)

Technical Skills

- **Deep Learning Frameworks:** Pytorch, Tensorflow
- **Programming Languages:** Python, Java, C#, C++
- **Softwares:** Visual Studio, Android Studio, Eclipse, MATLAB, Simulink, Vivado, Autodesk 3ds Max, Unreal Engine 4
- **Others:** Verilog, Git, Linux, LATEX

Extra-curricular Activities

- **Hobbies:** Reading Research Papers, playing Video Games, Swimming, Reading Books