Saksham Khandelwal

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EDUCATION

Indian Institute Of Technology Bombay, Mumbai, India   July 2017 - May 2021
Bachelor of Technology in Electrical Engineering
Minor in Computer Science and Engineering

KEY PROJECTS UNDERTAKEN

Neural Style Transfer in Videos — *Deep Learning, Computer Vision Spring '19 - present*
Prof. Arjun Jain |Computer Science and Engineering |IIT Bombay

- Implemented a neural Algorithm of **Artistic Style transfer** in PyTorch over video frames
- Adjusted weighting factors α, β for content and style reconstruction respectively
- Developed an **optical flow** algorithm using deep learning techniques to maintain long term and short term **temporal consistency** among the video frames by forward and backward warping using **Kanade-Lucas-Tomasi** feature point tracker

OCR using Pixel Link — *Computer Vision*   *Dec '18 - present*
Deep Learning Engineer and Core Team Member, Augle AI

- Developed optical character recognition using **PixelLink** and MinAreaRectangle of Open CV for **scene text segmentation** referencing https://arxiv.org/abs/1801.01315
- Used above algorithm, along with **NLP** to develop a **universal identity card reader**
- Developed state of the art handwriting recognition by training **VGGnet** over combined **IAM** and **EMNIST** datasets and hence, making a document reader with over 95% accuracy
- Used **SIFT** for tracking feature points to extract data from forms using a pre-filled template

Scholar Finder — *Natural Language Processing and Web Scraping*   *Sep '18 - Dec '18*
Guide : Prof. Asim Tewari

- Scraped details of scholars working on specified research fields using Elsevier Scopus API
- Designing a **Machine Translation** based **encoder-decoder network** extracting keywords from abstracts to make a semantic similarity baseline for analyzing data
- Implementing a **Seq-2-Seq Attention** based **Text Summarizer** model for generating abstracts from research articles based on recent models developed by Google, Facebook and IBM Watson

Deep Learning and Artificial Intelligence — *Reading Project*   *Sep '18 - Dec '18*
Guide : Prof. Asim Tewari

- Studied various Artificial Neural Networks such as **CNNs, RNNs, GANs** and their use cases
- Implemented object classification over **CIFAR - 10** using CNNs in Pytorch
- Designed a movie review application using **sentiment analysis** involving **word embeddings** and **LSTMs** over Rotten Tomatoes dataset with current accuracy of 82 %

Chord Extractor — *Machine Learning, Signal Processing*   *Aug '18 - Nov '18*
India Innovation Contest Design Challenge '18

- Aim to build a device to extract **chords** and **beats** from a track playing in vicinity
- Analyzed various convex optimization techniques and chose **Stochastic Gradient Descent** over **Pitch Class Profile** vector obtained through optimized routines
- Used mini batches optimiser in **SGD** getting a **95% train** and **85% test** accuracy
- The contest is in association with **Texas Instruments** and **Govt. of India**

Competitive Coding — *Reading Project*   *Summer '18*
Web and Coding Club, IIT Bombay
- Studied the essential **Data Structures and Algorithms** and their underlying theory
- Researched different **Programming Paradigms** and their uses in various problems
- Practically applied all the concepts in **Competitive Coding** on various online judges
- Covered topics like Dynamic Programming, Graph Algorithms, BackTracking and more

ACHIEVEMENTS

- Secured All India Rank **186** in **JEE advanced** among 0.2 million Aspirants   *{'17}*
- Achieved an **All India Rank 644** in **JEE Mains** among 1.2 million Aspirants   *{'17}*
- Bagged Gold medal for being in the **Top 35** student in **INChO** (Chemistry Olympiad) *{'16}*
- Among top 1% in **NSEP** and **NSEA** and selected for **INAO** (Astronomy Olympiad)   *{'16}*
- Recipient of the **KVPY** fellowship by the Govt. of India securing **All India Rank 173** *{'15}*
- Awarded the **NTSE** Scholarship by NCERT among **1000** students across India   *{'15}*
- Presented with a gold certificate for securing **AIR 44** in **Technothlon** by IIT Guwahati *{'14}*

TECHNICAL SKILLS

- **Programming:** MATLAB, JavaScript, C/C++, Python, Java, Raspberry Pi, Arduino
- **Libraries:** PyTorch, TensorFlow, Scipy, Theano, MLpack, SciKitlearn, OpenCV
- **Software:** GNU Octave, Git, Github, LaTeX, GNUplot, Jupyter, Eagle, SPICE, AutoCAD

POSITIONS OF RESPONSIBILITY

Joint Secretary — Electrical Department Council   *Apr '18 - Present*
Department of Electrical Engineering, IIT Bombay
- Conducted an introduction of the discipline to the incoming batch of **140 students**
- Planned events including Department **Sports Day** and **Cultural Day** and ideated on treks and trips to increase the bonding of the students of electrical engineering discipline

Coordinator, Media and Public Relations   *Apr '18 - Present*
Student Alumni Relations Cell (SARC), IIT Bombay
- Part of the 8 member media and public relations team of **IIT Bombay's SARC**
- Articulated **monthly newsletters** for the alumni and wrote **2 blogs** for the cell

KEY COURSES UNDERTAKEN

- **Electrical:** Electronic Devices & Circuits, Introduction to Electrical Systems, Network Theory, Signals & Systems**, Digital Systems**, Analog Systems**, Electrical Machines & Power Electronics**
- **Mathematics and Statistics:** Calculus, Linear Algebra, Differential Equtions 1 & 2, Complex Analysis, Data Interpretation & Analysis
- **Other Courses:** Quantum Physics & Applications, Physical Chemistry, Economics, Computer Programming & Utilization, Biology, Basis of Electricity & Magnetism, Computer Vision**, Machine Learning for Remote Sensing**
- **Online Courses:** Data Structes and Algorithms by Princeton, Machine Learning by Andrew NG, Computer Vision(CS231N) by Stanford, Do Your Venture by IIMBx

(** to be completed by May '19)

EXTRA CURRICULAR ACTIVIES

- Attended the **Vijyoshi Camp** which serves as a forum for interaction between bright young students and leading researchers in the fields of Science and Mathematics
- Gave a performance in the convocation hall in front an audience of **2000** as a keyboardist during **Surbahaar**, the flagship event of IIT Bombay's Music Club **Symphony**
- Underwent one year long training in **Keyboard** and its theory under NSO