Kushagra Mahajan

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Education

Carnegie Mellon University, School of Computer Science **Aug. 2021 – Present**
Master of Computational Data Science — GPA: 4.06/4.00 *Pittsburgh, PA*

- Coursework: Machine Learning, Machine Learning for Large Datasets, NLP, Cloud Computing, Visual Learning and Recognition, Multilingual NLP

Indraprastha Institute of Information Technology Delhi (IIIT Delhi) **Aug. 2014 – Dec. 2018**
Bachelor of Technology in Computer Science — GPA: 8.78/10.00 *Delhi, India*

- Coursework: Computer Vision, Probabilistic Graphical Models, Data Mining, Collaborative Filtering, Machine Learning (Teaching Assistant - Fall '18), Data Structures and Algorithms, Compiler Design, Database Systems, Operating Systems.

Experience

Amazon **May 2022 – Aug 2022**
Software Engineering Intern — Installments Team *Seattle, WA*

- Improved web page notification system for payment failures to be more descriptive and provide rectification steps to customers.

Tata Research and Innovation Labs **Feb. 2019 – April 2021**
Researcher — Computer Vision Team | Advisors: Dr. Lovekesh Vig & Dr. Gautam Shroff *Delhi, India*

- Worked on cellular image analysis, distributed learning, meta-learning, Covid-19 diagnosis, skin lesion detection and chest x-ray region localization in collaboration with **ILBS, Delhi**. Published **4 papers**, pitched and built **2 products**.
- Worked on alignment and information extraction from document images. Product sold to **Landmark Group**. Published **1 paper** and filed **1 US patent**.

Intel Corporation **Aug. 2017 – Dec. 2017**
Undergraduate Technical Intern | Advisor: Mr. Tigi Thomas *Bangalore, India*

- **2M dollar IP project** on sensor based gesture detection and recognition. Main task was data preprocessing, building machine learning models considering memory constraints and output latency.

CVML Lab, IIIT Delhi **Aug. 2016 – Dec. 2018**
Undergraduate Researcher | Advisor: Prof. Chetan Arora *Delhi, India*

- Exploited the pose structure to enhance FGVC performance on standard datasets. Also used texture descriptors to improve clothing segmentation in a two-stream architecture. Published **2 papers**. Work was in collaboration with **Staqu Technologies**.

Projects

Natural Language Inference for Code-Switched Hinglish **Spring 2022**
Course Project: Multilingual NLP | Advisor: Prof. Alan Black

- Achieved state-of-the-art NLI performance on code-switched Hinglish by translating to matrix or embedded language, and domain adaptation of language models to the code-switched domain.

Twitter Cloud Native Web Service with Microservices **Spring 2022**
Course Project: Cloud Computing | Advisor: Prof. Majd Sakr

- Created an ETL pipeline for processing 1.2TB Twitter data, and a microservice based architecture for data retrieval, and running analytic jobs in a cost constrained setting.

Dynamic Traffic Light System **Spring 2017**
Course Project: Computer Vision | Advisor: Prof. Saket Anand

- Involves traffic density estimation at the junction, lane isolation, vehicle speed detection, KLT tracking to create a deployable system.

Skills & Achievements

Programming Languages: *Proficient:* Python, *Intermediate:* C, C++, Java, SQL, Latex
Frameworks & Tools: Tensorflow, Pytorch, Keras, PySpark, Caffe, OpenCV, Scikit, NumPy, Pandas, SciPy, EspNet, Kafka, Samza, HBase, MongoDB, AWS, Azure, Kubernetes
Achievements: *Travel Grant*: AICTE-INAE for ICIP 2018, *Dean's List*: 2017-2018, Teaching Fellow and Mentor at Vivekananda Kendra, Delhi.

Patents and Publications

- **K. Mahajan**, M. Sharma, L. Vig, Tata Consultancy Services Limited. "Method and System for Keypoint Extraction from Images of Documents". Filed at the Indian Patent Office. Number: 201921035983 (PCT filed. Number: WO2021044447A2)
- A. Pandit, **K. Mahajan**, S. Kunde. et. al. "Data-Efficient Training of High-Resolution Images in Medical Domain". 29th European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (ESANN) 2021.
- **K. Mahajan**, M. Sharma, L. Vig. et. al. "CovidDiagnosis: Deep Diagnosis of COVID-19 Patients Using Chest X-Rays". IEEE International Workshop on Thoracic Image Analysis, MICCAI 2020.
- **K. Mahajan**, M. Sharma, L. Vig. "Meta-DermDiagnosis: Few-Shot Skin Disease Identification using Meta-Learning". IEEE International Conference on Computer Vision and Pattern Recognition 2020 Workshops (CVPRW).
- **K. Mahajan**, M. Sharma, L. Vig. "Character Keypoint-based Homography Estimation in Scanned Documents for Efficient Information Extraction". CBDAR workshop at the 15th IEEE International Conference on Document Analysis and Recognition (ICDAR) 2019.
- **K. Mahajan**, T. Khurana, A. Chopra, I. Gupta, C. Arora, A. Rai. "Pose Aware Fine-Grained Visual Classification Using Pose Experts". 25th IEEE International Conference on Image Processing (ICIP) 2018.
- T. Khurana, **K. Mahajan**, C. Arora, A. Rai. "Exploiting Texture Cues for Clothing Parsing in Fashion Images". 25th IEEE International Conference on Image Processing (ICIP) 2018.