Simmi Mourya

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Education

- **University of Pennsylvania** — Philadelphia, PA
  *Master of Science in **Computer and Information Science**, GPA: **3.81/4.0*** — *Aug 2019 - May 2021*
  - **Coursework**: OS, Networked Systems, Analysis of Algorithms, Internet & Web Systems, Advanced Machine Perception, Comp. Linguistics, Computer Vision, Machine Learning. **Teaching Assistant:** CIS-581: Computer Vision
- **Cluster Innovation Center, University of Delhi,** — New Delhi, India
  *Bachelor of Technology in **Computer Science** and Computational Biology (minor), GPA: **8.2/10*** — *Aug. 2013 - July 2017*
  - **Computational Biology coursework**: Systems Biology, Macro and Micro Biological Networks, Biodefense and Bioengineering, In *silico* Biology, Applied Genomics and Proteomics, Wet-Lab experience (one semester)

Experience

- **Amazon, Packaging Innovation** — Seattle, WA
  Software Developent Engineer — *Jul 2021 - Present*
  - Implemented, tested, and deployed a packaging automation feature to enable shipping packages in vendor provided containers. The initiative is projected to generate Amazon **$280 million** in annualized savings towards packaging, transportation and labor cost in **16** fulfillment centers across **NA & EU**.
  - Built UI based alarm component for Packaging Decision Engine (PDE) Orchestration tool helping Data Scientists run data extraction and transformation jobs without interacting with complex code configurations.
  - Worked as a **Data Science** contributor to improve PDE, a **visual recognition** model that **decides packaging** based on **product images** captured during inbound. Added functionality to create, clone and monitor custom SageMaker jobs in a React based image labeling platform that handles **100,000 images** worth of traffic **per day**.
- **University of Pennsylvania** — Philadelphia, PA
  Graduate Research Assistant — *May 2020 - Dec 2020*
  - **Multimodal Question Answering framework**: Worked on **intersection of NLP and Computer Vision**. Developed a novel task framework for Goal-Step inference and Step membership inference using multimodal Wikihow data.
- **ESRI** — New Delhi, India
  Data Scientist — *May 2019 - July 2019*
  - **ArcGIS Python API**: Developed framework for **Multispectral support for Pixel classification** in **ArcGIS** Python API. Developed Pyramid scene parsing backbone support of object segmentation for the API.
  - **Spatial Dataframes**: Optimized validation checks in arcgis.geometry package using pre-compiled Cython binaries. This processes **0.1 million** entries in less than **2 ms**, which earlier took **45-55 ms**.
- **IIIT Delhi** — New Delhi, India
  *Deep Learning Research Associate, **Full-time*** — *Feb 2018 - March 2019*
  - **Article**: Mourya, S., Kant, S., Kumar, P., Gupta, A. and Gupta, R., 2018. LeukoNet: Discrete Cosine Transform-based CNN architecture for the classification of **normal versus Leukemic blasts** in B-ALL Cancer.
  - **Accepted Challenge**: **C**lassification of Normal versus Malignant Cells in **B-ALL White Blood Cancer Microscopic Images**, challenge selected at **IEEE ISBI '19**, Venice, Italy.
  - **LeukoGAN**: A Dual representative adverserial network based on U-Net ACGAN to **generate synthetic Cancer data**. Supervised and trained data collection team and managed in-house compute infrastructure.
- **Predible Health** — Bangalore, India
  Deep Learning Engineer — *August 2017 - December 2017*
  - **Development**: Developed **U-Net** based framework for **Lung nodule segmentation from 3D CT scans.** Also developed classifiers to analyze nodule level malignancy and emphysema. Built POC for identifying cancerous lung nodules from **Radiomics data**. Streamlined prototyping and testing via parallelization of the data pre-processing pipeline.
- **Google Summer of Code** — Portland State University
  Software Developer Intern — *May 2016 - August 2016*
  - **Cyvlfeat**: Designed and developed 12 new features for a **high-performance** Python/Cython wrapper of a **Image Processing library**, VLFeat. Emulated the wrapper from MATLAB MEX scripts.

Skills

- **Software**: Java, React, Mockito, C, AWS: (Lambda, DynamoDB, Cloudwatch, EMR, SQS, SNS, CDK, IAM etc.), Jenkins
  Research: Python, PyTorch, FastAI, Keras, Scikit-Learn, Cython, Python/C API, MATLAB
  Accepted Talks: *Scientific Computing using Cython: Best of both worlds!* - EuroScipy '18, Europython '17, Pycon India '17

Research and Software Projects

- **Computer Vision**: Built an attention mechanism in form of Region Proposal network (RPN) as a backbone for Mask RCNN. Implemented vectorized ROIAlign for FPN-ROI Mapping. Developed YOLO (end-to-end) for object detection, with a Non Maximum Suppression post-processing module. **NLP:** Developed Bilingual Named Entity Recognition module using Bi-LSTM CRF and Self Attention.
- **Search Engine**: Built a scalable web search engine hosted on Amazon AWS complete with a crawler, indexer, pagerank, and a front end. Worked majorly on developing a TF-IDF and Map-Reduce based scalable Indexer.