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 Applied Mathematics, GPA: 8.2/10 — *Aug. 2013 - July 2017*

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**.
  - Leveraged **Failure Mode Assessment** research to identify and influence critical code changes that were in flight. This prevented propagation of a failure mode to software that calibrates logistics for shipments.

- **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: DCT-based CNN architecture for the classification of normal versus Leukemic blasts in B-ALL Cancer.
  - **Accepted Challenge**: Classification of Normal versus Malignant Cells in B-ALL White Blood Cancer Microscopic Images, challenge selected at IEEE ISBI '19, Venice, Italy.
  - **R&D**: LeukoGAN: A Dual representative adverserial network based on U-Net ACGAN to generate synthetic Cancer data.

- **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 (LIDC-IDRI dataset) 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 computer vision 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.