

Simmi Mourya

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Philadelphia, PA 19104

EDUCATION

- **University of Pennsylvania** Philadelphia, PA
• *Master of Science in Computer and Information Science, GPA: 3.74/4.0* **Graduating May 2021**
• **Coursework:** Internet & Web Systems, Advanced Machine Perception, Comp. Linguistics, Computer Vision, Machine Learning
Teaching Assistant: Computational Linguistics, C++ Programming
- **Cluster Innovation Center, University of Delhi** Delhi, India
• *Bachelor of Technology in Information Technology, GPA: 8.2/10* Aug. 2013 – July 2017

SKILLS

- **Software:** Java, Apache: (Spark, Storm, Bench), Oracle BDB, PHP, HTML/CSS, Javascript, SQL, Nose, Jenkins, ArcGIS
- **Research:** Python, PyTorch, FastAI, Keras, Scikit-Learn, Numpy, Pandas, Caffe, Cython, Python/C API

SOFTWARE PROJECTS

- **Multi-threaded web server and Service framework:** A Java based web **HTTP 1.1 compliant web server** developed from scratch. Later merged it with a custom-built web service framework which emulates the behaviour of **Java Spark**. Services implemented: **Route registration, Session/Cookie management**, Filter handler, Request and Response handlers.
- **Web crawler and Search Engine:** Developed a **multithreaded web crawler** with a custom XPath Parser and to query and store matched HTML, XML documents into a persistent data store. Also developed a **Map-Reduced Based Indexer** Developed and scaled Hadoop based Indexer. DevOps for Gradle, EMR, Hadoop, EMRFS. Minor Hadoop DevOps for PageRank.

EXPERIENCE

- **University of Pennsylvania** Philadelphia, PA
• *Graduate Research Assistant* May 2020 - Present
 - **Multimodal Question Answering framework:** Advised by Prof. Chris Callison Burch. Developing a novel task framework for Goal-Step inference and Step membership inference using multimodal Wikihow data.
- **ESRI** Delhi, India
• *Software Developer* 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
• *Research Associate* 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.
- **Predible Health** Bangalore, India
• *Software Developer* 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 computer vision library, VLFeat. Emulated the wrapper from **MATLAB MEX** scripts. (Added algorithms specializing in image understanding and local features extraction and matching such as LBP, SIFT, hierarchical k-means, SLIC).
 - **Continuous Integration and Tests:** Extensively used **Continuous Integration platforms** such as Jenkins, Travis. **Built unit and integration tests** using Python's Nose test suite.
- **Spark Infosystems** New Delhi, India
• *Full Stack Developer Intern* May 2015 - August 2015
 - **Job-seeker-Employer Platform:** Extended functionality of an '**Indeed**' like **platform** by adding the Job-seeker and custom Test-series module. Helped automate hiring by redesigning a **customized self-evaluation** framework for job-seekers.

RESEARCH PROJECTS

- **Computer Vision:** Mask-RCNN from scratch: Built an **attention mechanism** in form of **Region Proposal network (RPN)** for Object detection task. Implemented **vectorized ROAlign** for FPN-ROI Mapping.
Developed **YOLO** pipeline (end-to-end) for **object detection**, with a **Non Maximum Suppression** post-processing module.
- **Computational Linguistics:** Developed **Bilingual Named Entity Recognition** using Bi-LSTM CRF and Self Attention.