Pratik Mangalore

https://pratmangalore.github.io/

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Education

- **University Of California, Los Angeles** — Los Angeles, CA
  Master of Science in Computer Science; GPA: (3.9/4.0) — *March 2020 (Expected)*
- **Indian Institute Of Information Technology, Allahabad** — Allahabad, India
  Bachelor of Technology in Information Technology; GPA: (3.9/4.0) — *July. 2014 – July. 2018*

Experience

- **Arista Networks** — Santa Clara, CA
  Software Engineering Intern - Routing & Algorithms — *July 2019 - Present*
  - **Unicast Routing**:
    - Added clean and scalable code to implement a command line based feature to the Arista EOS which allows the ARP module to modify its behavior based on the input configuration.
    - Implemented a variety of bug fixes and wrote breadth and stress tests to ensure precision and reliability.
- **University Of California, Los Angeles** — Los Angeles, CA
  Graduate Student Researcher - Dept. of Psychiatry and Behavioral Sciences — *Dec. 2018 - June 2019*
  - **Similarity Network Fusion**:
    - Implemented the Similarity Network Fusion, a belief propagation algorithm, to integrate complementary information from different data modalities such as fMRI, genetic and behavioral data. Performed spectral clustering on the fused network to obtain patient subgroups based on symptoms, genes, etc.
    - Developed a command line interface to perform statistical analysis on the patient subgroups.
- **Cisco Systems** — Bangalore, India
  Software Engineering Intern - Mobility Core Business Unit — *Jan. 2018 - June. 2018*
  - **Application Detection & Control (ADC)**: - Developed and integrated a low latency, N-Gram and Decision tree based heuristic machine learning algorithm to classify network traffic based on TCP payload data. The module was able to classify 97% of the traffic correctly.
    - Optimized memory usage for branches related to Machine Learning within the ADC module.
    - Developed and integrated an independent module which can auto-document logic for an application's protocol detection code.

Research & Projects

- **Developed a language invariant OCR using Unsupervised Machine Learning**: - Classified handwritten by converting input into a set of strokes which were learned using a novel combination of the Expectation Maximization algorithm and Probabilistic Latent Semantic Indexing.
- **Using HMM & Complex Network Measures to compute functional and causal connectivity in the brain**:
  - Mapped brain response activity for verbal and mathematical tasks to a connectome using Hidden Markov Models.
  - Applied Complex Network measures to differentiate the activity caused in response to verbal and mathematical tasks
- **Improved CPU Branch Prediction using CNN**: - Obtained CPU branch traces, extracted and learned spacio-temporal information using a variety of deep learning models. The CNN model obtained 87.43% accuracy, thus establishing itself as a proof-of-concept for using deep learning in branch prediction.
  - Parallelized the code using CUDA-10.1 and NVIDIA Tesla GPU to obtain a speedup by an order of 90.
- **Developed a Probabilistic Database enhanced with Open World Semantics**: - Implemented the Lifted Inference Algorithm to return the probability of a query being true. Enhanced the normal Lifted Inference Algorithm with open world semantics, hence allowing one to query items not strictly present within the probabilistic databases fed as input to the algorithm.
- **Dynamic Screen Clipper - (Self Project)**: - Developed a GUI app for the Windows OS, that can crop selected regions from an application and sticky it onto the screen. These regions retain full functionality of the application.

Programming Skills

- **Languages**: Python, R, C++, C, MATLAB, Java, C#,HTML,CSS
- **Tools & Libraries**: CUDA, Git, Perforce, NumPy, Scikit-Learn, Tensorflow, Keras
- **Relevant Coursework**: Data Structures & Algorithms, Machine Learning in Hardware, Deep Learning & Neural Networks, Natural Language Processing, OS, ML in Bioinformatics, Compiler Design, Software Engineering.