Shikhar Jaiswal

Email : jaiswalshikhar87@gmail.com
GitHub : `https://github.com/ShikharJ`
Phone : +91-9560266377

IIT Patna
Computer Science & Engineering
Final Year Undergraduate
GPA : 8.34/10.0

Honours & Achievements

Hyperlinks at appropriate places

- Achieved *98.71%* percentile in JEE Advanced (previously IIT-JEE) 2016 among 200,000 candidates
- Achieved *99.54%* percentile in JEE Main (previously AIEEE) 2016 among 1,200,000 candidates
- Achieved *99.13%* percentile in National Entrance Screening Test (NEST) 2016 among 40,000 candidates
- Recipient of the Kishore Vaigyanik Protsahan Yojana Scholarship in 2016 (*top 1400* students out of 100,000)
- Recipient of CBSE Award for Community Service - Human Rights and Social Equality 2013

Research Experience

Visiting Academic Researcher, University of Southern California *Summer '19*

Mentor: Prof. Benjamin Nye, Director of Learning Sciences - Institute of Creative Technologies

- Developed and deployed a variant of the active learning algorithm with weighted density policy for the SMART-E project for detecting user engagement with tutoring systems, funded by U.S. Office of Naval Research.
- Applied feature engineering to develop a set of generalisable engagement metrics for cross-system compatibility, and tackling cold start and automated annotation problems in play-tester environments.
- Achieved ~90% classification accuracy over a set of 5 distinct user groups with as little as 25 unlabelled samples.

Sentiment Induced Machine Translation Techniques *Winter '17*

Mentor: AI-NLP-ML Team, IIT Patna

- Implemented numerous probabilistic sentiment-driven pipeline routines using *VADER* (C. Hutto et al. 2014), in conjunction with the standard Phrase-Based Statistical and Neural Machine Translation models using *Moses SMT Library* (P. Koehn et al. 2007) and *OpenNMT Toolkit* (G. Klein et al. 2017).
- Benchmarked model performance against well known baseline models in the statistical and neural domain.

Industrial & Open Source Experience

Open Mainframe Project Intern - The Linux Foundation *Summer '18*

Mentor: Wolfgang Engel, SUSE Linux GmbH

- Built and deployed *6 software packages* compatible with s390x architecture for *SUSE Linux Enterprise Servers (SLES 12 and SLES 15)* on the *SUSE Package Hub* using *Open Build Service (OBS)* platform.
- Additionally worked on removing dependency issues and updated the entire *Haskell stack* on the SLES 12 channel.

Software Development Intern - HackerRank *Summer '18*

Manager: Harishankaran Karunanidhi, Co-Founder and CTO

- Shipped crash and memory leak fixes, thread-safe control abstractions and build improvements for *HackerRank*'s state-of-the-art mission-critical Code Checker.
- Applied custom mandatory access control abstractions for secure code execution under production environment.

Google Summer of Code - Mlpack *Summer '18*

Mentor: Marcus Edel

- Deployed implementations of Generative Adversarial Networks (GAN, Deep Convolutional GAN and Wasserstein GAN) and Restricted Boltzmann Machines (RBM and Spike and Slab RBM), achieving ~1.5x speed (single core aggregate) over *Sklearn*'s and *Tensorflow*'s implementations for similar accuracy of generated data.
- Added Cross Entropy, Layer Normalization, Bilinear Interpolation, Atrous and Transposed Convolution Layers.

Google Summer of Code - SymEngine *Summer '17*

Mentor: Isuru Fernando & Sumith Kulal

- Improved the overall infrastructure of *SymEngine*, an efficient, standalone C++ Computer Algebra System (CAS), and refactored its Python wrapper *SymEngine.py* for cross-compatibility.
- Introduced SymEngine as an optional core for SymPy, and *PyDy*, a multi-body dynamics tool-kit for speeding up their backend computations to the order of ~70x.

Independent Projects

Image Transfiguration using CycleGAN — *Deep Learning*

· Implemented an algorithmic pipeline in C++, to morph an image domain into another image domain, in a fluid way using Cycle-Consistent Adversarial Networks (Jun-Yan Zhu et al. 2018).

· Network can be trained to generate natural landscapes from Claude Monet's works, SVHN from MNIST and more.

Movie Recommendation Engine — *Recommender Systems*

· Developed a movie recommendation engine in Python utilizing a convex combination of multiple methods (proceeding from R. Salakhutdinov et al. 2007), achieving comparable accuracy against the Netflix CineMatch Benchmark.

· Implemented User-User and Item-Item based Collaborative Filtering methods on MovieLens 10M Dataset.

Pipelined MIPS Processor on FPGA — *Computer Architecture*

· Designed a Verilog package for 32-bit five-stage pipelined MIPS processor simulation on FPGA.

· Implemented Forwarding Unit, Flush Control Unit and Stall Control Unit modules for control and data hazards.

Gestures Alive — *Image Processing*

· Used OpenCV and NumPy to build a gesture recognition app using web-cam to detect and track hand gestures.

· Gestures are processed and matched with pre-defined custom gestures to produce identification output.

Accepted Talks

· SUSE Package Hub and Open Build Service | **Open Source Summit Europe** *October '18*

· SymEngine: Leveraging The Power Of A Computer Algebra System To Another | **SciPy India** *November '17*

· CAS For Different Programming Languages Using SymPy And SymEngine | **PyCon India** *November '17*

Mentoring

Google Summer of Code - Mlpack *2019*

· Responsible for code review and guidance of two students under 'Essential Deep Learning Modules' project.

Institute Student Mentorship Program *2018 - 2020*

· Academic guide to four freshmen year students over the period of two years.

Positions of Responsibility

SymEngine & Mlpack Collaborator *2017 - Present*

· Member of the push-access and code review team.

NJACK Coordinator, Computer Science Club *2017 - 2019*

· Responsible for organizing various programming related activities and talks in the institute.

Key Courses

Theoretical	Programming and Data Structures, Algorithms, Discrete Mathematics, Switching Theory, Formal Languages and Automata Theory, Computer Graphics, Network Science*, Foundations of Machine Learning* & Artificial Intelligence*
Labs	Programming and Data Structures, Algorithms, Switching Theory, Innovative Design, Databases, Computer Architecture, Operating Systems, Computer Networks & Artificial Intelligence*
Systems	Databases, Computer Architecture, Operating Systems & Computer Networks
Mathematics	Real and Complex Analysis, Linear Algebra, Differential Equations, Probability Theory and Random Processes, Optimization Techniques & Abstract Algebra