Dhruv Arya

Ludhiana, Punjab, India 141001 · +91 9585601969 · aryadhruv@gmail.com· durovo.github.io

Education

2015-Present **Vellore Institute of Technology** Vellore, Tamil Nadu, India
Bachelor of Technology in Computer Science and Engineering, CGPA 9.73/10
Received a **gold medal** for holding rank 1 out of almost 800 people on degree completion
Received a Merit Scholarship and an Endowment Award for academic excellence
Represented the concerns of my stream college-mates to the university administration and took part in course work related discussions as a Programme Representative

Courses Operating Systems, Machine Learning, Theory of Computation and Compiler Design, Artificial Intelligence
Computer Organisation and Architecture, Parallel & Distributed Computing, Database Management Systems

Experience

June '19-Present **Software Engineer At Microsoft India Development Center** Hyderabad
Worked as a software engineer in the internal digital security team
Technical Contributions:
- New open vulnerability detection module for a binary vulnerability analysis pipeline
- Implemented multiple search algorithms in search for a scalable and accurate solution

Impact:
- Significant reduction in analyst effort spent on searching for known vulnerabilities of binaries
- End-to-end binary analysis with a simple drag and drop user interface

May-July 2018 & Jan-June 2019
Software Engineering Intern At Microsoft India Development Center Hyderabad
Technical Contributions:
- Designed and built a system to automatically detect IoT devices in the network
- Rearchitected a codebase scanning service to be more orthogonal
- Designed a new load distribution heuristic for the codebase scanning infrastructure
- Refactored and redesigned an automated vulnerability analysis pipeline
- Created a new module to autocorrect OS state when it transitions to a vulnerable state

Impact:
- Increased visibility of IoT devices which are often vulnerable to cyber attacks
- Threefold increase in the speed of the code scanning service at no extra cost
- Automated binary analysis pipeline can now automatically install and test binaries
- Significant reduction in need for maintaining VM scanning infrastructure as skew in OS state can be auto-corrected

June 2017 **National Informatics Centre** New Delhi
Software Engineering Intern at Library Information Services
Technical Contributions:
- Customized open source packages DSpace and Koha for the library
- Added new features such as report generation
- Studied cyber attack vectors and fixed vulnerabilities

Impact:
- Expedited the security approval of the system
- Improved user experience because of tailor-made features

Ongoing **Contributor at Shogun Machine Learning Toolbox (LINK)**
Shogun ML Toolbox is a C++ based open source project for machine learning
Technical Contributions:
- Discovered and fixed a major bug in a probability calibration method (LINK)
- Added cross-validated calibration to the library (LINK)

Impact:
- The Platt scaling calibration method now gives correct numerical output
- Any classifier output can now be calibrated to give more reliable probabilities

Research and Selected Projects

2019 **Co-Authored two chapters on Deep Learning**

- Impact of Deep Learning on Artificial Intelligence Research (LINK)
- Convolutional Neural Networks: A Bottom-Up Approach (LINK)
- Will be published by De Gruyter as part of a monograph in January 2020
- Citation: Bhattacharyya, Siddhartha (Ed.), Vaclav Snasel (Ed.), Aboul Ella Hassanien (Ed.), et al. *Deep Learning. Research and Applications*. Berlin, Boston: De Gruyter, 2020. Web. Retrieved 8 Nov. 2019, from https://www.degruyter.com/view/product/546909

2019 **A Virtual Gym trainer that uses Computer Vision to Correct Form (LINK)**

- Won the Microsoft Ninja Edge IoT hackathon

2018 **Implementation of Exploration in TONIC using non-stationary volatile multi-arm bandits (LINK)**

- Found a problem in modelling TONIC (a social graph exploration problem) as a stationary multi-arm bandit problem
- Proposed modelling it as a non-stationary volatile multi-arm bandit problem instead
- Resulted in an overall 30% increase in execution time performance
- Will be published in: Soft Computing for Problem Solving 2018

2018 **Multi-Criteria Decision Making using Interval Valued Neutrosophic Soft Sets (LINK*)***

- Conducted survey to analyze consumer decision making behaviour in supermarkets
- Designed and analyzed a ranking mechanism for supermarkets using inter-valued neutrosophic soft sets
- Submitted to the International Journal of Knowledge-Based and Intelligent Engineering Systems

2018 **System to find points of similarity between people to encourage blood donations**

- Designed and implemented an algorithm that finds points of similarities between people
- Public social media profiles of people are automatically searched to find some similarities with the patient
- A personalized message is generated and sent to people found to encourage blood donations
- Placed amongst top 5 at ACM-VIT hackathon

2016 **Using Neurogenetic Techniques in Job Shop Scheduling for Makespan Minimization**

- Studied Genetic Algorithm and Neural Network techniques for Task and Job Scheduling
- Designed an algorithm for subjective scheduling which takes the needs of various clients into account

Relevant Courses

- Machine Learning by Stanford University on Coursera (Certificate Link)
- Deeplearning.ai (course 1, 4, 5) by Stanford University on Coursera (Certificates: C1, C4)
- Developing Android Apps by Google on Udacity (Audit)
- Deep Learning by Google on Udacity (Audit)
- Fast.ai course 2 (http://course.fast.ai/part2.html)

Leadership and Other Activities

- Core Committee Member at IEEE-CS VIT
- Helped the Rotary Club in organizing Tree Plantation drives, organizing Lohri festivities at the Deaf and Dumb School, and spreading awarenes about eye care by visiting villages
- Trained in First Aid Resuscitation. Helped spread awareness in general public about responding in emergency situations