

# Dhruv Arya

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## EDUCATION

2015-2019 **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 awareness about eye care by visiting villages
- Trained in First Aid Resuscitation. Helped spread awareness in general public about responding in emergency situations