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Personal information

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Nationality(-ies)	INDIAN
Date of birth	May 8 1988
Gender	Male

Summary

I am a research engineer with a strong grasp of mathematics, computer science and engineering. I have specialized knowledge in machine learning, data mining and graph algorithms as well as strong software engineering skills gained from industry experience and university.

Work experience

Place and Date	SAP Labs Bangalore, 2013 – 2015
Occupation or position held	Research Associate - Data Science
Roles and Responsibilities	I was a junior scientist at a next-generation applications team, which reported directly to the CTO at Palo Alto CA. My work was primarily in the design and development of Machine Learning and Data Mining projects in the domains of Health and Fitness, Bioinformatics and Internet of Things.

Education

Place and Date	KU Leuven, 2015 – 2016
Title of qualification awarded	Advanced Masters in Artificial Intelligence
Thesis	Kernel methods for deep learning in unsupervised contexts.
Major Courses	Machine Learning, Data Mining, Uncertainty in AI, Artificial Neural Networks, Support Vector Machines, Robotics, Computer Vision
Place and Date	Indian Institute Science (IISc), Bangalore, 2010 – 2013
Title of qualification awarded	Master of Science (in Engineering), Computer Systems
Thesis	Large scale graph clustering algorithms for botnet detection
Major Courses	Linear Algebra, Probability and Statistics, TCP/IP Networking, High Performance Computing
Place and Date	National Institute of Technology (NIT), Tiruchirappalli, 2006 – 2010
Title of qualification awarded	Bachelor of Technology, Mechanical Engineering

Projects

Location based recommendation systems (SAP)	In the Context of a Health and Fitness smartphone application, I developed a collaborative filtering based system to recommend users products and services from local businesses based on user's GPS and activity data. The project also utilized Data clustering techniques to extract location-based features of users.
Activity and user vital data acquisition from smartphone sensors (SAP)	The goal of this project was to profile users, based on their Heart rate and Footstep counts, which could be used to build recommendation systems. I designed a system which utilized signal and image processing techniques on the accelerometer and camera data to accomplish the objective. I also contributed to all the aspects of the software development of the android based mobile application and the associated backend database organization and REST services.
Topological pathway analysis (SAP)	The work aimed at identifying and ranking the most affected pathways in a differential gene expression experiment using PageRank on the augmented gene expression and gene-gene interaction graph data. This work has been submitted for publication and the implemented R package and is available on Github at `https://github.com/bhatturam/prius`.
Child health data acquisition systems (SAP)	Conceived, designed and lead the implementation of a low-cost system to track the height and weight of children in rural India. The data acquisition system was designed using a Microcontroller interfaced with sensors. A smartphone application was built to interface with the acquisition system and upload the data to the cloud for storage and processing.
Large scale graph based botnet detection (IISc)	This project aimed at detecting Botnets at the Internet infrastructure level, where the data velocity is very high. The approach relied on detection of nearly regular subgraphs of a large IP-IP graph. This work was published in a good computer security journal. During the course of this work, I developed "GRAFFY", a graph processing library in C++ which can be found at Github `https://github.com/BalkiLab/graffy` which was used extensively in our lab at IISc
Malware Classification and Clustering (IISc)	In this work, system call traces of application were used to classify them into known malware families using Hidden Markov Models (HMM). Unknown samples were clustered using the outputs of these models to enable labeling and perform further analysis. This work was submitted to a security conference.
Large scale machine learning and data mining (KU Leuven)	Worked on implementation of online classifiers- Hoeffding trees and Stochastic Gradient Descent based algorithms, approximate nearest neighbor search using the Locality Sensitive Hashing algorithm and various approximate counting and sampling techniques for large datasets.

Software development skills

Programming Languages	C/C++, Java, PERL, Python, R, MATLAB, SQL, PROLOG, Javascript
Parallel Programming	MapReduce, CUDA, OpenMP, MPI
Frameworks	Scikit-learn,WEKA,OpenCV,Arduino,Android, SAP HANA

Publications

Patil, SS., Venkatesh, B, and Singh, R. "From Differentiated Genes to Affected Pathways." bioRxiv (2016): 038901.

Venkatesh, B., Choudhury, S. H., Nagaraja, S., Balakrishnan, N. (2015). BotSpot: fast graph based identification of structured P2P bots. Journal of Computer Virology and Hacking Techniques, 11(4), 247-261.

Ravi, S., Balakrishnan, N., Venkatesh, B. (2013). Behavior-based Malware analysis using profile hidden Markov models. In 2013 International Conference on Security and Cryptography (SECRYPT)(pp. 1-12). IEEE.