Rajasekar Venkatesan, Ph.D.

Contact Information

Scientist
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Resume Summary

Data Scientist with 5+ years of experience in the field of *machine learning*. In-depth knowledge and research experience in *Neural Networks, Deep Learning, Natural Language Processing, Image Classification and Captioning, Machine Learning Techniques* and *Data Mining*.

Education

Nanyang Technological University (NTU), Singapore — August 2012 - August 2016
Ph.D., Machine Learning — CGPA: 4.75/5.0

- Thesis Title: Human-inspired Progressive Learning Technique for Classification Problems
- Advisor: Prof. Er Meng Joo

PSG College of Technology, Coimbatore, Tamil Nadu, India — July 2008 - May 2012
B.Eng, Electronics and Communication Engineering — CGPA: 9.82/10.0

Skills

Languages

Programming Languages	Python, R, Matlab, C, C++ Frequently used Python libraries: *Machine Learning:* `scikit-learn, pandas, numpy` and `scipy` *Deep Learning:* `tensorflow, pyTorch, keras` *NLP:* `gensim, NLTK, textblob`
Scripting Languages	Shell, Python, Perl
Hardware Description Languages	VHDL, Verilog

Machine Learning

New Contribution: Progressive learning, Label-independent (aka universal) classifier
Deep Learning: Image classification using CNN, Time series prediction using LSTM, RNN
Supervised Learning: Classification (SVM, DT, RF, Logistic Regression, MLP) and Regression (SVR, Linear and Polynomial Regression)
Unsupervised learning: Clustering (k means clustering and hierarchical clustering)
Reinforcement Learning: UCB and Thompson Sampling
Association Rule Learning: Apriori and eclat for learning association rules
Dimensionality Reduction: PCA and LDA

Version Control Systems: Git, CVS

Processor Architectures: ARM, 5604B (32 bit C), 5416 (16 bit DSP Processor), S12X (16 bit C), 8051(8 bit C), 8085(8 bit P)

Operating System

Server	Linux(Distros: Ubuntu, CentOS, Fedora), Windows
RTOS	µCOS II, QNX

Thesis Summary

Human-inspired Progressive Learning Technique for Classification Problems

- Development of human-inspired machine learning techniques for *classification* problems
- Neural Network based architecture for high speed multi-class and multi-label classification
- Introduced and developed the *progressive learning technique (PLT)* and incorporated *PLT* on Neural Network based online multi-class and multi-label classifiers
- Developed a *universal classifier* that can be used for binary, multi-class and multi-label classification problems using Single hidden layer feedforward neural network

Work Experience

Institute of Infocomm Research, A*Star, Singapore
Scientist — August 2017 - Present
Development of machine learning techniques for cybersecurity applications

Nanyang Technological University, Singapore
Researcher — September 2016 - July 2017

- Time series prediction using deep architectures, online learning of high speed streaming data
- Received appreciation from Rolls Royce Technical Team in UK for achieving significant results using the developed deep architecture

Juniper Networks, India
Software Engineering Intern January 2012 - May 2012

- Developed intelligent automated tools for Network Address Translation(NAT) and various NAT types
- Received commendation for excellence from Director of the business unit, Juniper Networks Headquarters, Sunnyvale, USA

Teaching Experience

Nanyang Technological University, Singapore

- Completed a certified course on University Training for Teaching Assistance by NTU
- Handled tutorial classes and laboratory classes for undergraduate students in NTU
- Closely worked with supervisor in writing research grants and developing course modules
- Mentored 6 undergraduate students in their FYPs (Final Year Project), 4 overseas exchange students and 4 MEng students

Selected Publications*

R. Venkatesan, M.J. Er, "A Novel Progressive Learning Technique for Multi-class Classification", Neurocomputing, vol. 207, pp. 310-321.

R. Venkatesan, M.J. Er, M. Dave, M. Prathama, S. Wu, "A Novel Online Multi-label Classifier for High-speed Streaming Data Applications", Evolving Systems, 2016, pp.1-13.

R. Venkatesan, M.J. Er, S. Wu, M. Prathama, "A Novel Online Real-time Classifier for Multi-label Data Streams", International Joint Conference on Neural Networks, Vancouver, Canada, 2016, pp. 1833-1840.

R. Venkatesan, M.J. Er, "Multi-label Classification Based on Extreme Learning Machines", International Conference on Control, Automation, Robotics and Vision, pp. 619-624.

R. Venkatesan, M.J. Er, Ning Wang, Chiang-Ju Chien, "Progressive Learning Strategies for Multi-class Classification", International Automatic Control Conference (Accepted for Presentation)

M.J. Er, **R. Venkatesan**, N. Wang, "A High Speed Multi-label Classifier Based on Extreme Learning Machines", International Conference on Extreme Learning Machines, vol. 2, pp. 437-454.

M.J. Er, **R. Venkatesan**, N. Wang "An Online Universal Classifier for Binary, Multi-class and Multi-label Classification", IEEE Conference on System, Man and Cybernetics, 2016, To be published.

M.J. Er, **R. Venkatesan**, "A Survey of Cognitive Architecture for Cognitive Robotics", Book Chapter, Data Mining and Knowledge Discovery, Under Review.

A. Narayanan, M. Chandramohan, **R. Venkatesan**, L. Chen, Y. Liu, S. Jaiswal, "graph2vec: Learning Distributed Representations of Graphs", In Workshop on Mining and Learning with Graphs (co-located with KDD), 2017

M.J. Er, V.K. Yalavarathi, N. Wang, **R. Venkatesan**, "A Novel Incremental Class Learning Technique for Multi-class Classification", Advances in Neural Networks, ISNN2016, pp. 474-481.

M. Dave, S. Tapiawala, M.J. Er, **R. Venkatesan**, "A Novel Progressive Multi-label Classifier for Class-incremental Data", IEEE Conference on System, Man and Cybernetics, 2016, To be published.

Y. Zhang, M.J. Er, **R. Venkatesan**, N. Wang, M. Pratama, "Sentiment Classification Using Comprehensive Attention Recurrent Models", International Joint Conference on Neural Networks, Vancouver, Canada, 2016, pp. 1562-1569.

* *Complete list of publications is available in http://rajasekarv.wixsite.com/rajasekar-venkatesan/publications*

Awards and Scholarships

Awarded *NTU Research Scholarship* for four consecutive years, 2012-2016.

Awarded a *gold medal* by PSG College of Technology for being an outstanding student during undergraduate studies.

Awarded *best all-rounder award* by PSG College of Technology for excelling in academic, co-curricular and extra-curricular activities during my undergraduate studies.

Awarded *Central Government of Indias outstanding students scholarship* called Central Sector Scholarship for four consecutive years 2008-2012.

Won *second place* in self-guided car race, a Smart Car race competition in KRIYA11 conducted by Freescale Semiconductors in PSG College of Technology

References

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