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Sreenivasan Ramasamy Ramamurthy

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Education

University of Maryland Baltimore County (UMBC) — **Baltimore, MD** — **Jan 2017 – Dec 2021 (Expected)**
- **Ph.D. in Information Systems, GPA: 3.90/4.00**

VIT University — **Vellore, India** — **Jul 2014 – May 2016**
- Master of Technology in Bio medical Engineering, GPA: 9.07/10.00

Amrita Vishwa Vidyapeetham — **Coimbatore, India** — **Jul 2008 – May 2012**
- Bachelor of Technology in Electronics and Instrumentation Engineering, GPA: 7.23/10.00

Research Experience

Graduate Research Assistant — **University of Maryland Baltimore County, Baltimore** — **Jan 2017 – Present**
- Building a sensor system using wearable and ambient sensors to efficiently capture the activities of the older adults for a early detection of onset of Neuro-degenerative diseases such as Alzheimer's and further track the progression of the disease.
- Investigating machine learning and deep learning algorithm for human activity recognition, functional and behavioral health assessment from the activities.

Junior Research Fellow — **Indian Institute of Technology Bombay, Mumbai, India** — **Oct 2016 - Nov 2016**
- Conducted through literature survey to design an interfacing circuit for a tactile sensor array. Also, conducted preliminary study to display a color map of the pressure applied on the tactile sensor array using MATLAB.
- Worked on the interfacing an Arduino board with an Electrocardiogram circuit and to a computer. Developed a MATLAB code to view, analyze the ECG signals and perform correlation studies to compare the signals obtained from different electrode materials.

International Visiting Research Student — **University of Adelaide, Adelaide, Australia** — **Dec 2015 - Apr 2016**
- Study of developing virtual application specific integrated circuit(ASIC) that mimics the ASIC prototype such that the fall prediction algorithm can be test on the virtual platform.
- Developed a fall detection algorithm.

Work Experience

Executive - Projects — **Mytrah Energy (India) Ltd, Hyderabad, India** — **Jun 2012 - Jun 2014**
- In charge of planning and execution of 33KV electrical systems for a 100 MW wind farm project.

Languages and Technologies

- C, C++, Python, R
- MATLAB, LabView, Linux

Technical Experience

Academic Projects
- **Image super-resolution with context**: For images accompanied with text associated with it, super-resolution of the images was achieved using the contextually similar images. Text mining techniques such as stop word removal, stemming, tf-idf, singular value decomposition followed by K-means clustering to cluster semantically similar images. Alternatively, Doc2Vec was also used and compared with K-means clustering. Convolutional Neural Network was used for image super-resolution.
- **Analyzing and mitigating sensor heterogeneity using deep learning**: Sensor heterogeneities in body sensor network such as sampling rate heterogeneity, sensor biases, and sampling rate instability were investigated and Convolutional-Deconvolutional Neural network was proposed to create a super-resolution of signals to mitigate the heterogeneities.

- **Deceptive Opinion Spam Detection using Aspect level Sentiment Analysis**: Investigated supervised and unsupervised machine learning methods to classify deceptive reviews. Aspect level sentiments of the reviews were extracted and used as features for algorithms such as SVM, Naive Bayes, Random Forest, Multilayer Perceptron, k-NN. Latent Dirichlet Allocation(LDA), Latent Semantic Analysis(LSA) features were used for unsupervised classification. Finally, the relationships between the aspects, their sentiments and their relationship with the deceptiveness of the review was studied.
- **Detection of Mesothelioma Disease Using Statistical Learning Techniques**: Performed statistical analysis such as feature extraction, model selection, best feature selection to improve the accuracy of classifying Mesothelioma disease.
- **A threshold based fall detection algorithm using continuous wavelet transform**: Designed an algorithm to detect fall of elderly people from the accelerometer data in real time. Identified significant features such as magnitude of resultant acceleration, absolute coefficient of wavelet transformed resultant acceleration at high and low frequencies. A threshold based algorithm was developed and the false alarm rate was drastically reduced.
- **Segmentation of Femur bone from computed tomography images using morphological operations**: Proposed an algorithm that automatically segments the femur bone from the computed tomography images. The edge of the bone from each slice of CT was segmented using morphological filters. Further, an area based approach was used to isolate the femur bone from patella, and the hip bone. The segmented data could be in future be used to create a 3D model of the bone.
- **Application of neural networks and chaos theory in rainfall prediction**: Developed a model that performs time-series prediction of precipitation using artificial neural networks (ANNs) using the historical precipitation data. In addition, an attempt was made to solve the issues like selection of the optimum sample size from the dataset for best prediction accuracy, selection of the optimal feature set, selecting the appropriate search algorithm, selecting the appropriate number of neurons, and the choice of the activation function.
- **Predicting the BSE Sensex: Performance comparison of adaptive linear element, feed forward and time delay neural networks**: This study compares the effectiveness of different types of Adaptive network architectures such as adaptive linear element, feed forward and time delay neural networks in one-step ahead prediction of the daily returns of Bombay Stock Exchange Sensitive Index (SENSEX). The performance of each network is evaluated using 17 different performance measures to find the best network architecture. Also, an empirical evaluation of the weak form of Efficient Market Hypothesis (EMH) for the data in reference is carried out.

Publications

Published

- Abu Zaher Md Faridee, **Sreenivasan Ramasamy Ramamurthy**, H M Sajjad Hossain, and Nirmalya Roy. 2018. HappyFeet: Recognizing and Assessing Dance on the Floor. In Proceedings of the 19th International Workshop on Mobile Computing Systems & Applications (HotMobile '18). ACM, New York, NY, USA, 49-54.
- Nair BB, Patturajan M, Mohandas VP, **Sreenivasan R.R.**. Predicting the BSE Sensex: Performance comparison of adaptive linear element, feed forward and time delay neural networks. *In Power, Signals, Controls and Computation (EPSCICON), 2012 International Conference* on 2012 Jan 3 (pp. 1-5). IEEE.

Accepted/Under Review

- **Sreenivasan Ramasamy Ramamurthy**, Nirmalya Roy. Recent Trends in Human Activity Recognition - A Survey (Accepted in Wiley's Interdisciplinary Reviews(WIREs) - Data Mining and Knowledge Discovery)
- H M Sajjad Hossain, **Sreenivasan Ramasamy Ramamurthy**, Md Abdullah Al Hafiz Khan and Nirmalya Roy. An Active Sleep Monitoring Framework Using Wearables (Accepted in ACM Transactions on Interactive Intelligent Systems)

Conference Presentations

- "Predicting the BSE Sensex: Performance Comparison of adaptive linear element, feed forward and time delay neural networks" in the International Conference EPSCICON in January 2012.
- "Segmentation of Femur bone from computer tomography images using morphological operations" in 10th International Science, Engineering and Technology conference conducted at VIT University in May 2015.

Professional Memberships

- Graduate Student Member of IEEE since October 2014
- Student member of ACM since Jan 2018

Professional Services and Outreach

- Publicity Co-chair - Third IEEE Workshop on Smart Service Systems (SmartSys 2018)
- Publicity Co-chair - Second IEEE Workshop on Smart Service Systems (SmartSys 2017)
- Member of the Organizing committee - Third National Conference on Recent Trends in Communication, Computation and Signal Processing organized by Amrita Vishwa Vidyapeetham, Coimbatore in February 2011.

- Conducted a workshop “Workshop on Electronic Design and Automation Tools” at Amrita Vishwa Vidyapeetham in January 2011.