CHINMAY SAHU

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EDUCATION

PhD Candidate, Electrical and Computer Engineering, Clarkson University (GPA 4.0/4.0) ***Fall 2017-Present***

M.S. Process Control Engineering, NIT, Tiruchirappalli (GPA 9.2/10.0) ***Fall 2013 - Summer 2015***

B.S. Electrical and Electronics Engineering, Biju Patnaik University of Technology (GPA 8.77/10.0) ***Fall 2008 -Spring 2012***

SKILLS

Programming Languages: Matlab, C ++, C#, Python.

Machine learning Concepts: Classification, Regression, Clustering, Recommender system, Deep learning, CNN, RNN.

AI Technologies: Numpy, Pandas, Matplotlib, TensorFlow, Scipy, Keras, Google Colab, Scikit-Learn.

Certifications: ML & Deep Learning Specialization by Andrew Ng (Coursera), Tensorflow specialization by Laurence Moroney.

Web: HTML, CSS, jQuery, JS (Beginner).

Database: MySQL, MongoDB (Beginner).

Relevant coursework: Digital Signal Processing, Coding & Information Theory, Detection & Estimation Theory, Adaptive Signal Processing, Pattern Recognition & Neural Networks, Advanced Applied Statistics, Advanced Biometrics.

Methodologies: Agile, Scrum, Design Patterns.

Operating Systems: Variants of Linux, Windows, Mac.

PROFESSIONAL EXPERIENCE

Research Assistant at Clarkson University, Potsdam, New York ***Aug 2020 – Present***

- Design and develop algorithms to solve problems in fields related to IoT, biomedical engineering, geo-hazards, behavioral biometrics and bias in face recognition.
- Dealing with research problems such as error analysis in wireless sensor networks, passive tracking, localization of secondary pacemakers, multi user classification for security and privacy, bias mitigation using skin reflectance in facial recognition software.

Research Data Scientist Intern at Potsdam Sensors, Potsdam, New York ***May 2020 – Aug 2020***

- Built indoor air exchange models to analyze the quality of air based on the real-time air contaminant data collected from the indoor air environment.
- Analyzed indoor air particle mass concentration data to understand air exchange rate, aerosol particle decay time in classrooms. This helped to identify the gap time between classes to protect students from airborne infections.
- Built localization models to localize sick patients suffering from cough, sneeze in indoor environments. The same localization model can help identify locations in classrooms where there is a spike in particle mass concentration.

Research Assistant at Clarkson University, Potsdam, New York ***Jan 2019 – Present***

- Design and develop localization algorithms to solve problems in fields related to IoT, biomedical engineering, geo-hazards, and behavioral biometrics.
- Dealing with research problems such as error analysis in wireless sensor networks, passive tracking, localization of secondary pacemakers, multi user classification for security and privacy.

Teaching Assistant at Clarkson University, Potsdam, New York ***Jan 2018 – Dec 2018***

- Instructor and grader for linear circuits for spring'18 for a class size of 72.
- Instructor and grader for junior year Electrical circuit design lab for fall'18 for lab size of 48.
- Provide weekly feedback to students on HW's and Lab reports. Conduct office hours to tutor.

Software Designer at Alstom Transport India Ltd. (C++, C#, Web technologies) ***Sep 2015 - July 2017***

- Delivered critical solutions to the client as a software designer, working on numerous backend windows based services built using WPF, WCF & MVC architecture in .NET; Collaborated with senior software designers to work on all tiers of the product development and gained expertise in writing codes and fixing bugs in .NET based development environment.
- Lead, architected & designed a testing tool for the client at Charleroi, Belgium.
- Researched, designed & developed a stable, scalable and maintainable testing framework for ASP.NET based applications with a strong focus on delivery and code maintainability, applied design patterns as and when appropriate to ensure extensibility of the system.

Research Scholar at National Institute of Technology, Trichy, India (MATLAB) ***July 2013 -Aug 2015***

- Developed and adapted a metaheuristic algorithm for a model design using real-time closed-loop data in Matlab.
- Designed an explicit model predictive controller for multi-variable and nonlinear processes using Matlab platform.

ACADEMIC PROJECTS

Relative Skin Reflectance in Face recognition to mitigate demographic bias (Machine Learning, Biometrics, Deep learning) ***Spring 2020-present***

- Measuring skin reflectance(SR) of subjects from multiple cameras on the same subject and using facial landmarks to measure relative SR.
- Using classical SR technique to quantify and improve face recognition algorithm bias.

Mutli user authentication for cybersecurity applications using localization techniques (Machine Learning, Biometrics, Localization) ***Fall 2019-present***

- Using keystroke data, known users are put in a reduced 2-D space using PCA, t-SNE, MDS using users raw keystroke timings.
- Using ordinal localization algorithm and KNN, an unknown user's true identity can be classified.

Estimating the core of spiral waves for atrial fibrillation ablation (IoT, Detection & estimation theory) ***Fall 2018-present***

- Designed and formulated two novel localization algorithms to identify the source of spiral waves during cardiac arrhythmia.
- Validated the algorithms by running Monte-Carlo simulations to evaluate the performance of algorithms in MATLAB.

PUBLICATIONS

- **Sahu, Chinmay**, Mahesh Banavar, Jie Sun, "A Novel Modified and Generalized Time Delay of Arrival Algorithm for Target Estimation in Non-homogeneous Media." (In preparation).
- **Sahu, Chinmay**, Mahesh Banavar, Stephanie Schuckers, "A novel distance-based algorithm for multi-user classification in keystroke dynamics". (In Preparation).
- Divyesh, V. R., **Chinmay Sahu**, Velswamy Kirubakaran, T. K. Radhakrishnan, and Muralidharan Guruprasath. "Energy optimization using metaheuristic bat algorithm assisted controller tuning for industrial and residential applications." *Transactions of the Institute of Measurement and Control* 40, no. 7 (2018): 2310-2321.
- **Sahu, Chinmay**, V. Kirubakaran, T. K. Radhakrishnan, and N. Sivakumaran. "Explicit model predictive control of split-type air conditioning system." *Transactions of the Institute of Measurement and Control* 39, no. 5 (2017): 754-762.
- Kirubakaran, V., **Chinmay Sahu**, T. K. Radhakrishnan, and N. Sivakumaran. "Energy efficient model based algorithm for control of building HVAC systems." *Ecotoxicology and environmental safety* 121 (2015): 236-243.

INTERNATIONAL CONFERENCE PRESENTATIONS

- **Sahu, Chinmay**, Mahesh Banavar, Stephanie Schuckers, A novel distance-based algorithm for multi-user classification in keystroke dynamics, Asilomar 2020 (Accepted).
- **Sahu, Chinmay**, Mahesh Banavar, Jie Sun, Vanitha M, Estimating the center of a rotor for AFib Ablation, ic-ETITE 2020.
- **Sahu, Chinmay**, Mahesh Banavar, Jie Sun, Modified Time Delay of Arrival for Biomedical and Environmental Applications, Asilomar 2019.
- **Sahu, Chinmay**, T. K. Radhakrishnan, and N. Sivakumaran. "Real time closed loop data based estimation and explicit model based control of an air conditioning system implemented in hardware in loop scheme." In *2015 International Conference on Robotics, Automation, Control and Embedded Systems (RACE)*, pp. 1-7. IEEE, 2015.
- **Sahu, Chinmay**, V. Kirubakaran, T.K. Radhakrishnan, N. Sivakumaran, Closed loop building data based estimation and energy efficient model predictive control of Heating Ventilation and air conditioning system, International Conference on Green Technology for Environmental Pollution Prevention and Control 2014, NIT Tiruchirappalli (2014) 239.

POSTER PRESENTATIONS

- **Chinmay Sahu**, Mahesh Banavar, Jie Sun, Optimized Modified Time delay of arrival for Biomedical and Geo-hazard Applications, 2019 Annual Summer Research and Project Showcase, Aug 2019, Clarkson University, Potsdam, NY. [*Won "Best Poster Presentation" in the Computational Methods (Graduate) category]*
- **Chinmay Sahu**, Mahesh Banavar, Jie Sun, Estimating the core of spiral waves for Atrial Fibrillation Ablation, Third Annual Spring Research and Project Showcase, April 2019, Clarkson University, Potsdam, NY. [Won "*Best Poster Presentation" in the Mathematical Methods and Simulations (Graduate) category]*
- **Chinmay Sahu**, Mahesh Banavar, Jie Sun, Jack Koplowitz, Estimating the core of spiral waves for Atrial Fibrillation Ablation, Center for Identification Technology Research (CITeR) Conference, Nov 2018, Niagara Falls, NY.
- **Chinmay Sahu**, Mahesh K. Banavar, Performance comparison of matrix decomposition algorithms in event detection, Research and Project Showcase, July,18, Clarkson University.
- **Chinmay Sahu**, Kevin V. Mack, Mahesh K. Banavar, De-noising and event extraction from noisy wireless data using Go-Decomposition algorithms, Research and Project Showcase, April,18, Clarkson University.

AWARDS

- Best Poster Presentation in the Computational Methods (Graduate) category in 2019 Annual Summer Research and Project Showcase, Aug 2019, Clarkson University, Potsdam, NY.
- Best Poster Presentation in the Mathematical Methods and Simulations (Graduate) category in Third Annual Spring Research and Project Showcase, April 2019, Clarkson University, Potsdam, NY.

REFERENCES

1. Prof. Mahesh Krishna Banavar,
   Associate Professor
   Electrical and Computer Engineering
   Email: mbanavar@clarkson.edu
   Phone:315/268-3883
   Mailbox: CU Box 5720
   Web: https://webspace.clarkson.edu/~mbanavar/wordpress/
2. Prof. Stephanie Schuckers,
   Paynter-Krigman Endowed Professor in Engineering Science/ Director of the Center for Identification Technology Research (CITeR)
   Electrical and Computer Engineering
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