Chinmay Sahu

chinmay.sahu20@gmail.com | 315-262-6605 | LinkedIn: chinmaysahu | Github: chinmaysahu | 89 Maple St, Potsdam, NY

Seeking Career Opportunities starting from June 2021

EDUCATION

Ph.D. Candidate, Electrical and Computer Engineering, **Clarkson University** (GPA: 4.0/4.0) *Fall 2017-Present **(Expected: May 2021)***

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

- **Languages & Database:** (Proficient) Python, Matlab, C#, C++, Latex; (Prior Experience) Java, SQL, CSS, jQuery, Javascript.
- **Machine Learning Libraries:** Numpy, Pandas, Matplotlib, TensorFlow, Scipy, Keras, PyTorch, OpenCV, DLIB, CUDA, Scikit-Learn.
- **Machine Learning Concepts:** Classification, Regression, Clustering, Recommender Systems, Computer Vision, CNN, RNN, NLP.
- **Relevant Coursework**: Digital Signal Processing, Coding & Information Theory, Detection & Estimation Theory, Adaptive Signal Processing, Pattern Recognition & Neural Networks, Advanced Applied Statistics, Advanced Biometrics.
- **Certifications:** ML & Deep Learning Specialization by Andrew Ng (Coursera), Tensorflow specialization by Laurence Moroney.

PROFESSIONAL EXPERIENCE

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

- Design and develop machine learning algorithms to solve problems in fields related to IoT, biomedical engineering, geo-hazards, bio-aerosol source localization in an indoor environment, behavioral biometrics, bias mitigation in face recognition and language models. Experience in solving research problems such as error analysis in wireless sensor networks, passive tracking, compressed sensing using RPCA and Go-Dec, localization of secondary pacemakers in atrial fibrillation, multi-user classification for security and privacy, demographic bias mitigation using skin reflectance as a tool in facial recognition software, ERP/ERN analysis in EEG dataset, feature extraction and classification from keystroke audio dataset.

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 interval 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 due to presence of more number of people than permissinle limits.

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

- Instructor and grader (Linear circuits, sophomore level, Spring 18, class of 72; Electrical circuit design lab, junior level, Fall 18, lab size of 48)

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

- Delivered critical solutions to the client by 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 (Control Systems, MATLAB) *July 2013 -Aug 2015*

- Developed and adapted a metaheuristic algorithm for building HVAC systems 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 (2017 - Present) (LINKS)

Mitigating bias in Language Models (NLP, BERT, Deep learning)

- Objective is to investigate and analyze different language models to prevent bias in text. Researched topic classification using NMF, and LDA. Investigating to classify hate in text and tweets using BERT based text classification model.

Mitigating demographic bias in Face recognition using Skin Reflectance (Machine Learning, Biometrics, Computer Vision, Deep learning)

- Objective is to quantify the effect of skin reflectance to mitigate bias across demographics. Proposed a novel skin reflectance(SR) mesaure for subjects under different lighting conditions by detecting face and extracting landmarks from the face using NIST MEDS-II (1k images), CMU Multi-PIE (750k images), Morph dataset (55k images), and FairFace Challenge dataset (96k images). Used Individual Typology Angle (ITA) to quantify skin tone of subjects to match Fitz-patrick skin type standards. Designing a explainable deep lerning model with a softmax loss function to quantify race of subjects with a certain confidence.

Mutli-User authentication for cybersecurity applications using localization techniques (Machine Learning, Biometrics, Localization)

- Objective is to design a pipeline to identify multiple users accessing a keyboard (System/Mobile) based on their typing patterns. Used keystroke data of known users to extract features and project them in a reduced 2-D space using PCA, Kernal-PCA, t-SNE, MDS. Used an ordinal localization algorithm along with a set of clustering algorithms (X-means, DB-SCAN, GMM, KNN) for identifying number of users accessing a system and classifying them based on the nearest neighbor rule.

Estimating the core of spiral waves for atrial fibrillation ablation (IoT, Localization, Detection & estimation theory

- Designed and formulated two novel modified time difference of arrival (mTDOA) based 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. Extended the same algorithm to estimate forest fire propagation speed and tsunami wave speed along with source estimation.

PUBLICATIONS (LINKS)

- **Sahu, Chinmay**, M. Banavar, J. Sun, "A Novel Modified and Generalized Time Delay of Arrival Algorithm for Target Estimation in Non-homogeneous Media." (In preparation).
- **Sahu, Chinmay**, M. Banavar, S. Schuckers, "A novel non linear transformation based multi user classification algorithm for fixed text keystroke behavioral dynamics". (In Preparation for IEEE T-BIOM).
- Divyesh, V. R., **Chinmay Sahu**, V. Kirubakaran, T. K. Radhakrishnan, and M. 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 (LINKS)

- Bahmani, K., R. Pleash, **Chinmay Sahu**, S. Schuckers, M. Banavar, A Skin Reflectance Estimate based measure to mitigation bias in face recognition, IWBF 2021 (to be Submitted).
- **Sahu, Chinmay**, M. Banavar, Nonlinear Feature Transformation-Based Multi-User Classification For Keystroke Dynamics, CVPR Workshop 2021 (To be Submitted).
- **Sahu, Chinmay**, M. Banavar, S. Schuckers, A novel distance-based algorithm for multi-user classification in keystroke dynamics, Asilomar 2020.
- **Sahu, Chinmay**, M. Banavar, J. Sun, Vanitha M, Estimating the center of a rotor for AFib Ablation, ic-ETITE 2020.
- **Sahu, Chinmay**, M. Banavar, J. 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**, M. Banavar, J. 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**, M. Banavar, J. 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**, M. Banavar, J. Sun, J. 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**, M. K. Banavar, Performance comparison of matrix decomposition algorithms in event detection, Research and Project Showcase, July,18, Clarkson University.
- **Chinmay Sahu**, K. V. Mack, M. 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.

OTHER ACADEMIC ACHIEVEMENTS, HONORS, AND ACTIVITIES

- Session Chair for "Applications of Deep Learning I" at Asilomar Conference on Signal, System and Computers 2020.

REFERENCES

- Available upon request.