Samrat Nath

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EDUCATION

University of Arkansas (UA), Fayetteville, Arkansas, USA

- Doctor of Philosophy (Ph.D.) student in Electrical Engineering (Expected) May 2020
  - *Cumulative GPA*: 4.00 / 4.00
  - *Courses*: Machine Learning | Statistical Inference | Computational Statistics | Multivariate Analysis | Regression Analysis | Time Series Analysis | Detection and Estimation | Wireless Communications

Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

- Bachelor of Science (B.Sc.) in Electrical and Electronic Engineering Jul 2014
  - *Cumulative GPA*: 3.71 / 4.00
  - *Courses*: Digital Signal Processing | Communication Theory | Random Signals & Process | Probability & Statistics | Control System | Power System

TECHNICAL SKILLS

- Programming Languages: MATLAB, R, Python, C, C++, SQL
- Data Science Frameworks: Scikit-learn, TensorFlow, Alteryx, Tableau
- Engineering Softwares: Proteus, PSpice, Simulink
- Document Preparation & Presentation: LaTeX, MS Word, MS Excel, MS PowerPoint, Prezi

PROFESSIONAL EXPERIENCE

University of Arkansas, Fayetteville, Arkansas, USA Jan 2016 – Present

- Graduate Assistant, Department of Electrical Engineering

  Research Assistant:
  - Performed research with focus on Statistical Signal Processing, Optimization, Machine Learning, and Wireless Communication.
  - Published 2 journals and 4 conference papers.

  Teaching Assistant:
  - Assisted in grading of courses such as Systems and Signals, Probability and Stochastic Process.
  - Instructed 50 students on average each year on MATLAB.

Walmart, Bentonville, Arkansas, USA Jun 2019 – Aug 2019

- Summer Intern Data Analyst, Global Business Service Digital Solutions
  - Developed an app using Alteryx for estimation & optimal allocation of maintenance budget in HVAC & Refrigeration sector of stores with Regression and Optimization models built in R.

RESEARCH EXPERIENCE

University of Arkansas Jan 2016 – Present

- Optimized Scheduling in Communication Network
  - Formulated a scheduling strategy for information pushing system based on optimal stopping time theory to optimize the delay and energy efficiency.
  - Designed Markov decision process (MDP) based multicast scheduling scheme in delay-constrained content-centric wireless networks while optimizing overall system cost.
- Low-latency Anomaly Detection
  - Developed a real-time algorithm for detecting false data injection attacks and state estimation in smart grid with dynamic models and evaluated the analytical performance of the algorithm using Markov-chain.
  - Proposed a sequential algorithm for quick change point detection in a system with multiple post-change models under both bayesian and non-bayesian setting.

Bangladesh University of Engineering and Technology Mar 2013 – Jul 2014

- Image Processing and Pattern Recognition
  - Developed algorithms for human action recognition based on spatio-temporal variations of human silhouette while applying classification methods such as kNN and SVM.
  - Designed schemes for lip contour extraction using morphological reconstruction based segmentation approach with k-means clustering.

SELECTED PUBLICATIONS

- **Journal**
  - [Accepted] **S. Nath**, I. Akingeneye, J. Wu, and Z. Han, "Quickest Detection of False Data Injection Attacks in Smart Grid with Dynamic Models," in *IEEE Journal of Emerging and Selected Topics in Power Electronics*, Aug 2019.
  - **S. Nath**, J. Wu, and J. Yang, "Delay and energy efficiency tradeoff for information pushing system", in *IEEE Transactions on Green Communications and Networking*, vol. 2, no. 4, pp. 1027-1040, Dec 2018.
- **Conference**
  - **S. Nath**, J. Wu, and H. Lin, "Optimum Multicast Scheduling in Delay-Constrained Content-Centric Wireless Networks", in *Proc. IEEE Intern. Commun. Conf. (ICC)*, Shanghai, China, May 2019.
  - **S. Nath** and J. Wu, "Bayesian quickest change-point detection with multiple candidates of post-change models", in *Proc. IEEE Global Conf. on Signal and Information Processing (GlobalSIP)*, Anaheim, CA, U.S.A., Nov 2018.
  - **S. Nath**, J. Wu, and J. Yang, "Optimizing age-of-information and energy efficiency tradeoff for mobile pushing notifications", in *Proc. Intern. Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, Sapporo, Japan, Jul 2017.
  - S. I. Audin, **S. Nath**, S. Basak, F. S. Rahman, R. Nath, and S. A. Fattah, "A human action recognition scheme based on spatio-temporal variation of region of interest in horizontal and vertical direction", in *Proc. Intern. Conf. on Informatics, Electronics & Vision (ICIEV)*, Dhaka, Bangladesh, May 2014.
  - R. Nath, F. S. Rahman, **S. Nath**, S. Basak, S. I. Audin, and S. A. Fattah, "Lip contour extraction scheme using morphological reconstruction based segmentation", *Intern. Conf. on Electrical Engineering and Information & Communication Technology*, Dhaka, Bangladesh, Apr 2014.

ACADEMIC AWARDS & SCHOLARSHIPS

- Dean's List Award, *BUET* 2010 – 2012
  - Obtained Honors (3.75) grade point in junior and senior years.
- University Admission Test Excellency Scholarship, *BUET* 2009
  - Ranked in top 1% among 7000+ applicants in undergraduate admission test.
- Dhaka Education Board Scholarship, *Ministry of Education, Bangladesh* 2008
  - For excellence in Higher Secondary School Certificate Examination (H.S.C).
- Perfect Attendance Certificate, *Notre Dame College, Dhaka, Bangladesh* 2008
  - Maintained 100% class attendance in higher secondary school.

LEADERSHIP EXPERIENCE

- President, Bangladesh Student Organization at the UA Jun 2017 – May 2018
  - Managed a registered student organization of 37 Bangladeshi students.
  - Organized an annual cultural event with 130+ guests.

PROFESSIONAL AFFILIATIONS

- Member, IEEE Jan 2018 – Dec 2019
- Member, IEEE Young Professionals Jan 2018 – Dec 2019
- Member, IEEE Signal Processing Society Jan 2019 – Dec 2019

REFERENCE Available upon request.