ANIK KUMAR SAMANTA

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Research Areas

Statistical Signal Processing, Signal Analysis, Estimation and Detection Theory
Fault Diagnosis
Embedded System Development

Research Experience

June 2016 – present: Ph.D. Research Scholar, Advanced Technology Development Centre, IIT Kharagpur. Thesis to be submitted before December 31, 2020.
Oct 2012 – June 2016: Research Engineer, Centre for Railway Research, IIT Kharagpur.
June 2011 – Oct 2012: Project Engineer, Real Time Embedded System Lab, IIT Kharagpur.
Teaching Assistance: Embedded Systems Lab (3 semesters), Real Time Signal Processing Lab (2 Semester), Statistical Signal Processing (2 semesters)

List of Publication

Patents Filed:

1. A. Routray, A. Naha, **A. K. Samanta,** Amey Pawar, Chandrasekhar Sakpal, "A system for assessment of multiple faults in induction motors", WO2019167086A1, 2019

Journal Publication:

1. **A. K. Samanta**, A. Routray, S.R. Khare, & A. Naha, "Minimum Distance-based Detection of Incipient Induction Motor Faults using Rayleigh Quotient Spectrum of Conditioned Vibration Signal [ACCEPTED]", in IEEE Transactions on Instrumentation and Measurement
2. **A. K. Samanta**, A. Routray, S.R. Khare, & A. Naha, "Direct Estimation of Multiple Time-varying Frequencies of Non-stationary Signals". Signal Processing, 2020
3. **A. K. Samanta**, A Naha, A Routray, AK Deb "Fast and accurate spectral estimation for online detection of partial broken bar in induction motors", Elsevier Mechanical Systems and Signal Processing, 2018
4. A. Naha, **A. K. Samanta**, A. Routray and A. K. Deb, "Low Complexity Motor Current Signature Analysis Using Sub-Nyquist Strategy With Reduced Data Length," in IEEE Transactions on Instrumentation and Measurement, vol. PP, no. 99, pp. 1-11.
5. A. Naha, **A. K. Samanta**, A. Routray and A. K. Deb, "A Method for Detecting Half-Broken Rotor Bar in Lightly Loaded Induction Motors Using Current," in IEEE Transactions on Instrumentation and Measurement, vol. 65, no. 7, pp. 1614-1625, July 2016.
6. A. Naha, K. R. Thammayyabbabu, **A. K. Samanta**, A. Routray and A. K. Deb, "Mobile Application to Detect Induction Motor Faults," in IEEE Embedded Systems Letters, vol. PP, no. 99, pp. 1-1.
7. C. Pradhan, C. N. Bhende, and **A. K. Samanta**. "Adaptive Virtual Inertia-Based Frequency Regulation in Wind Power Systems." *Renewable Energy* (2017).
8. A. Naha, **A. K. Samanta**, A. Routray, and A. K. Deb "Determining Autocorrelation Matrix Size and Sampling Frequency for MUSIC Algorithm", Signal Processing Letters, IEEE, vol.22, no.8, pp.1016-1020, Aug. 2015.

9. A. Mukherjee, A. Routray, and **A. K. Samanta**, "Method for On-line Detection of Arcing in Low Voltage Distribution Systems", IEEE Transactions on Power Delivery Aug. 2015
10. **A. K. Samanta**, A. Naha, D. Basu, A. Routray, and A. K. Deb, "Online Condition Monitoring of Traction Motor", Book chapter in Handbook of Research on Emerging Innovations in Rail Transportation Engineering, IGI Global.

Academic Qualification

- Pursuing Doctor of Philosophy in signal processing from IIT Kharagpur, CGPA (till coursework): 8.67
  Presently working on estimation of parameters under non-stationary conditions and detection theory with specific application for detecting anomaly of mechanical systems. Thesis submission before Dec. 31, 2020
- Completed Master of Science (by Research) from IIT Kharagpur, CGPA: 9.69/10.
  Thesis Title: Designing Real-Time Diagnostics for Squirrel Cage Induction Motors
  (a) Setting up 22-kW squirrel cage induction motor fault experimental test bed. (b) Development of low-complexity, high-resolution spectral estimator. (c) Development of a real-time SCIM fault simulator.
- Passed B. Tech from Dr. B. C. Roy Engineering College (W.B.U.T) in Electronics and Communication Engineering with a GPA of (8.19/10) in 2011.
  Thesis Title: 'An Intelligent Direction Monitoring Wireless System for Moving Objects'.
- (10+2) from South Eastern Railway Mixed Higher Secondary School (CISCE) with 78.8% in 2006.
- 10th from Sacred Heart High School (CISCE) with 80.6% in 2004.

Mentoring and Supervision

- 2019: Supervised a team of five interns for development of IoT-based fault detector, portable fault simulator, implementation of spectral estimators, and explored graph signal processing for earthquake epicenter estimation.
- 2018: Supervised two interns for non-stationary frequency estimation and detection of stationarity.
- 2017: Development of wireless CT, Internet based fault detection, and modification of Android based fault detection with four interns.
- 2016: Development of Android based fault detection system with one intern.
- 2015: Modification of the SCIM simulator with .mat initialization with one intern.
- 2014: Supervised a team of six interns for ARM implementation of the fault detection algorithm, efficient solvers for matrix inversion and fast implementation of matrix multiplication.
- 2013: Mentored three interns in developing the SCIM fault simulation platform using SIMULINK real-time.
- 2012: Mentored a team of two interns in developing ARM-based signal processing application using CMSIS.

Hardware/Software Proficiency

- Hardware Platforms: Intel-based SBC, STM Discovery boards, and Raspberry Pi.
- Software Packages: MATLAB, Simulink, Simulink Realtime, Python, Google Colabs, LaTeX.

Achievements

- Secured **All India Rank** of **225**, with a rank of **35 in chemistry** nationwide in National Science Talent Search Examination '05.
- An active member of organizing committee of Entrepreneurship Week '09, (champion's runners up.)

- Won the second prize for exhibiting **'Burning but not burning'** at S. E. Rly. Boys High School in 2006.

Extra-Curricular Activities

Professional Activities:
- Chair, IEEE Signal Processing Society Student Branch Chapter, IIT Kharagpur (2017-2019).
- Founding member and Treasurer of IEEE Signal Processing Society Student Branch Chapter, IIT Kharagpur (2016-2017).
- Graduate Student Member IEEE, and IEEE Signal Processing Society.
- Reviewer of
    - IEEE Transaction on Instrumentation and Measurement
    - IEEE Transaction on Industrial Applications
    - IEEE PES Transactions on Sustainable Energy
    - Elsevier Measurement
    - Elsevier Shock and Vibration
    - International Journal of Electrical and Computer Engineering (IJECE)
    - IEEE Engineering in Medicine Biology Conference
    - International Conference on Systems in Medicine and Biology 2016
- Hobbies:
    - Swimming
    - Numismatics.
    - Reading novels.

Personal Details

- Date of Birth: 10th January 1988.
- Father's Name: Pankaj Kumar Samanta.
- Languages Known: English, Hindi, and Bengali.

I hereby declare that the above information is true to the best of my knowledge.

Regards

Anik Kumar Samanta

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(ANIK KUMAR SAMANTA)
Date: December 23, 2020   Place: Kharagpur, WB.