Ann Soniya M Micheal

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Education

2021-ongoing **Research Scholar**, *Advanced Technology Development Center*, IIT Kharagpur.

2012-2014 **Chemical Process Control,Master of Technology** , *Government Engineering College Thrissur*, University of Calicut.
GPA – 8.09/10

2004–2008 **Electronics and Instrumentation, Bachelor of Technology**, *MG University*.
GPA – 77.78/100

Research Projects

2024–Ongoing **Processing of regular and irregular sound streams using EEG in humans**, *Information Processing Laboratory, IIT Kharagpur*, *PI: Dr. Sharba Bandyopadhyay*.
Designed active/passive paradigms; built an EMOTIV-EEG pipeline from task to analysis (MATLAB).

2024–Ongoing **Computational model for processing periodic and aperiodic sequences**, *Information Processing Laboratory, IIT Kharagpur*, *PI: Dr. Sharba Bandyopadhyay*.
A recurrent network using Wilson–Cowan E/I framework with adaptation to test differential responses (MATLAB).

2021–Ongoing **Processing of regular and irregular sound streams in auditory cortex (mouse models)**, *Information Processing Laboratory, IIT Kharagpur*, *PI: Dr. Sharba Bandyopadhyay*.
Characterized dynamics/adaptation; compared selectivity across regular vs irregular sequences; reproducible MATLAB analysis.

2019-2020 **Assistive training Technologies for differently-abled and Elderly**, *Co-Investigator: Dr.Finto Raphel, Sahrdaya College Of Engineering and Technology,Trissur*.
- Working on virtual environment based Assistive training Technologies for differently-abled and Elderly.
- Funded by Sahrdaya College of Engineering and Technology of Rs.1,00000/- under Faculty Research Seed Money Grant.

2019-2020 **Communication Aid for Cerebral Palsy children**, .
- Developing an eye gaze-based communication aid for cerebral palsy children
- In association with the National Institute of Physical Medicine and Rehabilitation
- Best project Sristi-2020 (7th national level technical project exhibition and competition)

2019-Ongoing **Automatic Reprocessing of Dialyzer filter**, *Co-Investigator: Dr.Yuvraj V, Sahrdaya College Of Engineering and Technology,Trissur*.
- Automated dialyzer cleaning unit used in a dialyzing machine with the help of Programmable logic controllers
- Funded by Kerala startup Mission of Rs. 54000/- under IEDC-idea day grant.

2018-2019 **EEG controlled robotic arm**, *Principal Investigator*.
- Developed a robotic arm controlled by EEG signals with bio-signals obtained from BIOPAC and controlled using Arduino.

2017-2018 **Biofeedback based Automated physiotherapy unit**, *Principal Investigator*.
- Developed a Physiotherapy unit with automated rehabilitation movements with the assistance of EMG modules and Arduino.

Experience

Jun 2022,Jun 2023 **Teaching Assistant** , NPTEL.
- Cognition and Computation
- Computational Neuroscience

Jan 2016–Jan 2021 **Assistant Professor**, Dept. of Biomedical Engineering,
Sahrdaya College Of Engineering and Technology.

- Program Coordinator of Biomedical Engineering from 2018.
- Principal Investigator of Project and Research lab, Biomedical Engineering
- Principal Coordinator of various Undergraduate Projects.
- Handles courses like Mechatronics,Artificial Neural Networks,Control theory,Micro controllers,Biomedical Instrumentation

Jun 2014- Dec 2015 **Assistant Professor** , Dept. of Applied electronics and Instrumentation ,
Vimal Jyothi Engineering College,Kannur.

- Principal Coordinator of various Undergraduate and Graduate Projects
- Handled courses like Process Dynamics and Control ,Biomedical Instrumentation,Control theory.

Dec 2013 - Apr 2014 **Research Project Intern** , APEP, Indian Space Research Organisation .

- Designed a fuzzy logic controller for continuous crystallization unit at APEP, ISRO.

Mar 2009- Jul 2012 **Test Engineer**, Infosys Technologies Limited .

- Specialisation in Software testing of Point of sales machines.
- Acquired generic training from INFOSYS focused on C, C++, Mainframe Technologies, Software Testing, POS Testing.

Master Thesis

Jun 2013-Apr 2014 **Modeling and control of continuous crystallization plant** , *APEP,ISRO*.

- Designed a fuzzy logic controller for continuous crystallization unit at APEP, ISRO Aluva using SIMULINK
- Mathematical Modeling of the plant was carried out and the system transfer function was generated.
- Different control strategies were developed and compared.
- The controller design using a fuzzy logic controller was finalized and employed based on the system response.

Undergraduate Project

Jan- Apr 2008 **Instrumentation and Control of Ammonium Scrubber unit**, Fertilizers and Chemicals Travancore(FACT) .

- Detailed study of the Instrumentation units in ammonium scrubber unit of FACT., Data Acquisition, and Process control units of Ammonium scrubber unit.
- Hand on experience in Data Acquisition , Allen Bradley PLC systems and Yokogawa DCS systems.

Skills

Languages	C/C++,Python
Applications	MATLAB/SIMULINK, LABVIEW,Arduino
Design	Point Of Sales Testing, PCB Design, Electronics System Design
Communication	English(SRW), Hindi(SRW), Malayalam(SRW)

Publications

Micheal, Ann Soniya M. and Bandyopadhyay, Sharba," Inter-Token Silence Period Spiking Activity Enhances Selectivity of Distinct Groups of Auditory Cortical Neurons to Periodic and Aperiodic Sound Sequences" http://dx.doi.org/10.2139/ssrn.5354646

A Micheal, S Bandyopadhyay,"Processing of regular and irregular sound streams in mouse auditory cortex",SFN neuroscience 2024, PSTR403

ASM Micheal, A De, S Bandyopadhyay,"Selectivity to periodic sequences of sound in auditory cortical single neurons",IBRO Neuroscience Reports 15, S695

De, A., Raghavendra, K., Soniya, A. and Bandyopadhyay, S.,"Differential Effects of Two-Tone Harmonics and Single Tone Tokens on Subsequent Sounds", Association for Research in Otolaryngology, 2023, Orlando, FL

Ann Soniya M Micheal,Manoj N,"Design Of Fuzzy Logic Controller For Continuous Crystallization"at the International Conference on Advances in Chemical Engineering and Technology. Publisher: Elsevier, ISBN: 9789351072843

Marymol P, Ann Soniya M, Reshma K V, Reema Mathew,"Automatic Fire Fighting Robot"at the International Journal of Advanced Research in Computer Science and Software Engineering. ISSN :2277128X, Vol 5,Issue 5, May 2015

Ann Soniya, Keerthi Chacko, Avinashe K K, Akhil Jose,"Implementation of Solar powered Voice Recognition Robot"at the Global Journal for Research Analysis, ISSN : 22778160, Vol 4,Issue 5, May 2015

Teenu Jose, Divya K V, Marymol Paul, Ann Soniya,"A method for Reducing Three Phase Power Capacitor Switching Transients"at the International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, ISSN : 23203765, Vol 4,Issue 3, March 2015

References

Dr. Sharba Bandyopadhay,
Assistant Professor ECE,
IIT Kharagpur,
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Dr. Nihar Ranjan Jana,
Professor, Dept. of Bioscience,
IIT kharagpur,
nihar@iitkgp.ac.in.