AMITASH NANDA

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Research Interests

Software Development, Data Analysis, Computational Analysis, Explainable AI, Machine Learning, Deep Learning, Vision, Edge AI, Robot Perception, Planning and Learning

Education

Master of Science — Electrical and Computer Engineering (Intelligent Systems, Robotics and Control)

Jacobs School of Engineering, University of California San Diego — Expected 2023
La Jolla, California, United States

- Fall and Winter quarter tution fee waiver, GPA: 3.65/4

Bachelor of Technology — Instrumentation and Electronics Engineering (National Board of Accreditation (NBA) Accredited)

College of Engineering and Technology — April 2019
Bhubaneswar, India

- Top 5 of the Department with a CGPA of 8.60
- Awarded CET Merit Scholarship

Work Experience

Software Engineer— Accenture Labs (R&D) Sept 2020 to Aug 2021

- Researched and devised a state-of-the-art novel chaotic testing application to test robustness of a robot system.
- Contributed to backend GUI design, implemented Gazebo-ROS functionalities, and integrated on AWS S3 and RoboMaker.

Associate Software Engineer — Accenture Technology Jun 2019 to Sept 2020

Accenture MD&I Innovation Project- 3DXGO & Bedrock

- Automated end-to-end user stories of Airbus Product Life Cycle Management using Image and Text-based recognition.
- Accomplished customization and integration of PLM functionalities using RESTful web services and Apache Cordova.

Research Experience

Graduate Student Researcher — Boolean Lab Sep 2021 to Present

Computational Analysis of Biological data-sets
Supervisor: Prof. Debashis Sahoo, Boolean Lab, University of California San Diego, California

- Research on processing, visualizing, and performing computational analysis on biological datasets (Macrophage, IBD, NASH, Neuroblastoma).
- Performing research on significance of synthetic data in machine learning and deep learning for healthcare and robotics.

Research and Development Volunteer — Panda Lab May 2021 to Aug 2021

Circadian Rhythm-Bio Clock: Life Cycle Intervention based on Food Network
Supervisor: Prof. Satchidananda Panda, Regulatory Biology Laboratory, Salk Institute for Biological Studies, San Diego, California

- Developed and analysed food network models with circadian stability.
- Collected and processed data from application and created interactive network visualization using NetworkX and Bokeh.

Research Assistant —CET, Bhubaneswar Sept 2018 to April 2019

Plant Sustainability Enhancement using Deep Learning Techniques
Supervisor: Prof. Mihir Narayan Mohanty, Dept. of ECE, ITER, SOA University

- Developed a non-contact, robust and drone based plant sustainability enhancement system for remotely monitoring the plant health and receiving the on-site data.
- Granted 600 USD under the guidelines Technical Education Quality Improvement Program III (TEQIP), A Unit of MHRD, Govt of India for Implementation of World Bank Assisted Projects in Technical Education.

Research Intern — Escorts Agri Machinery May 2017 to April 2018

Computer Vision Assisted Autonomous Intra-Row Weeder
Supervisor: Dr. Nijagun Hiremath, DGM, Escorts Ltd

- Led the hardware team to implement a computer vision assisted model to classify weed and cabbage using Haar Cascade Classifier and wheel encoding principle.
- Designed and developed a table-top model to simulate the autonomous weeding process.
- Seed funded 3000 USD from Escorts Group to facilitate research.

Publications

1. R. Vedula et al., "Computer Vision Assisted Autonomous Intra-Row Weeder", *2018 International Conference on Information and Technology (ICIT)*, IEEE, Bhubaneswar, India, 2018, pp.79-84, doi: 10.1109/ICIT.2018.00027

2. Vedula R., **Nanda A**., Swain K.K., Das S., Mohanty M.N. (2020) Plant Sustainability Monitoring Using Unmanned Aerial Vehicle. In: Kumar A., Paprzycki M., Gunjan V. (eds) ICDSMLA 2019. Lecture Notes in Electrical Engineering, vol 601. Springer, Singapore, doi: 10.1007/978-981-15-1420-3$_1$28

3. **A. Nanda**, K. Swain, K. S. Reddy and R. Agarwal, "sTransporter: An Autonomous Robotics System for Collecting Fresh Fruit Crates for the betterment of the Post Harvest Handling Process," *2020 6th International Conference on Advanced Computing and Communication Systems (ICACCS)*, IEEE, Coimbatore, India, 2020, pp. 577-582, doi: 10.1109/ICACCS48705.2020.9074439

4. **A. Nanda**, K. K. Swain, K. S. Reddy, "Real-Time Internal Inspection of Pontoons of Floating Roof Tank using a Mobile Robot", *International Journal of Advanced Research in Computer Engineering & Technology (IJARCET)*, 2019, pp. 158-161, Volume-8, Issue-5, ISSN: 2278-1323

5. **A. Nanda**, A. Mohanty, K. Swain, T. K. Patra, "sRailer: A Secure Automated Indian Railway Track Switching System towards Smart Transportation", *International Journal for Research in Applied Science & Engineering Technology*, Oct 2020, Volume-8, Issue-X, ISSN: 2321-9653, doi:10.22214/ijraset.2020.31881

6. **Amitash Nanda**, D. Ahire "An Autonomous Intelligent System to Leverage the Post Harvest Agricultural Process using Localization and Mapping", International Conference on Intelligent Systems and Sustainable Computing (ICISSC, 2021)

Manuscripts Submitted

1. Dharanidhar Dang, **Amitash Nanda**, Debashis Sahoo, "NeuCASL: From Logic Design to System Simulation of Neuromorphic Engines", 2021 Formal Methods in Computer-Aided Design (FMCAD).

Manuscripts Completed

1. **Amitash Nanda**, Chinmay Das, T. K. Patra, "Sustainable Enhancement of Saplings based on Deep Learning Techniques and Internet of Things".

Awards

ICACCS, IEEE, Coimbatore March 2020
- Best paper award among papers from participants from all over the country.

Major Thesis Dept of Instrumentation & Electronics April 2019
- Best Thesis award among 30 groups.

ISTE Technical Symposium CET Bhubaneswar Chapter March 2018
- Best paper award among 40 papers from participants from colleges all over the state.
- Received a cash prize of 125 USD.

Robotics Camp by Infosys August 2018
- Winner among 30 teams and received certificate of appreciation and trophy.

Accenture Innovation Challenge October 2018
- Finalist among Twenty Thousand proposals all over India.

IICDC, Texas Innovation Challenge 2017-2018
- Quarter Finalist, Top 500 over 5000 teams applied.

E-Yantra Robotics Competition, IIT Bombay 2017-2018
- Semifinalist, Top 100 over 3000 teams applied.

Projects

OrgaLearn — An organoid mining technique

- A Novel Deep Learning Scheme to investigate organoid in real-time.
- Researching to improve the OrgaQuant model built by MIT developing better functionalities and features.

Chaos Robo— A novel chaotic testing application

- Chaos Engineering implementation to develop a fault tolerant robot application.
- Designed and developed perturbation, node kill, add objects, and latency functionalities for robot chaos testing application.

Plant sustainability enhancement using deep learning techniques

- Efficient ResNet-CNN model for health classification of plant saplings.
- Collaborated and developed an autonomous, robust, and non-contact system for saplings to monitor growth, vicinity, and health conditions using ResNet-CNN and MQTT IoT protocol.

Skills and Communication

Technical Skills
- Languages: *Python, C/C++, MATLAB, Simulink, HTML, CSS, JavaScript*
- Libraries: *PyTorch, TensorFlow, Scikit-learn, Pandas, OpenCV, Numpy, Matplotlib, Keras, Flask, NetworkX, Bokeh*
- Frameworks, and Simulator: *Jupyter, PyQt, Tkinter, Gazebo, V-Rep, RViz, SLAM, GMapping, Blender 3D*
- Database, Tools, and Cloud: *SQL, MongoDB, LaTeX, Git, ROS, Colab, Kaggle, AWS S3 and RoboMaker, Azure*