Homagni Saha

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Professional summary

I am a passionate and results driven machine learning and computer vision engineer in autonomous systems domain. I have proposed and published >20 articles (citations >120, H index =5) in top conferences and journals on information fusion and decision-making using machine learning. As a full scholarship, PhD candidate I have helped secure research funding from several agencies such as ARPA-E, NSF (National Science Foundation), and NRI (National Robotics Initiative).
As a professional, I have built efficient machine learning pipelines for challenging customer problems while reducing time and cost to deployment. I love teamwork, curiosity, creativity, and goal driven hard work.

Work History

Danfoss Power Solutions - Computer Vision Engineer
Cambridge, MA, USA
06-01-2021- Present
- Design modular machine learning function blocks to interface with customer applications such as object detection, lane tracking, row crop following and behavior cloning
- Establish machine learning and computer vision pipelines for challenging customer problems in off-highway autonomy, optimize for fast inference on arm-based devices using TensorFlow lite
- Setup data collection and model training with various 3D sensors (Ouster OS1, Velodyne, Carnegie Multisense stereo) and testing on edge AI based processors (TI Jacinto)

Honeywell Aerospace - Computer Vision and AI Researcher
Plymouth, MN, USA
_05-09-2019- 08-20-2019_
- Research and development of multi-agent multi-modal perception-based navigation algorithms using reinforcement learning. Developed techniques to be used in next-gen Urban Air Mobility (UAM) projects.
- A perspective on multi-agent communication for information fusion

Iowa State University - Graduate Research@ _Self Aware Complex Systems (SCS) Lab_
Ames, IA, USA
_08-01-2016- 05-07-2021_
- Pursue interdisciplinary research at the intersection of mechanical engineering and computer science. Resulted in concurrent degrees in computer science and mechanical engineering.
- Publish 20 articles including journals, conferences, and workshop presentations.
- Leading role in preparing grant proposals, resulting in successful funding from various sources such as ARPA-E, NSF, NRI.

National Institute of technology Rourkela - Undergraduate Research
Rourkela, Odisha, India
_2012-2016_
- Develop Arduino code for walking gait generation of bipedal robot. Entire design and prototype has a pending patent.
- Intelligent biped mobile robot to mimic human being. Application-Number:201631024088, Indian patent application
- Founder of team Tiburon, a student organization for autonomous underwater vehicles. Our team has been featured in Robosub competitions. As a founding member I worked towards securing startup funds, prototype initial designs and worked heavily on classic computer vision techniques for underwater vision

Selected Publications

- A modular vision language navigation and manipulation framework for long horizon compositional tasks in indoor environment
- Learning State Switching for Multi-sensor Integration
- Granger Causality Based Hierarchical Time Series Clustering for State Estimation
- Battery-Free Camera Occupancy Detection System
- A Novel Multirobot System for Plant Phenotyping
- Multimodal sensor fusion framework for residential building occupancy detection
- Few-shot Deep Learning for AFM Force Curve Characterization

Professional Services

- Served as reviewer for Transactions on Spatial Algorithms and Systems journal.
- Served as a reviewer for Scientific Reports journal.
- Served as a reviewer for Journal of Energy and Buildings.
- Served as a reviewer for American Controls Conference (ACC)- 2019,2020.
- Served as a lab mentor in Young Engineers and Scientists (YES) programme, organized by Iowa State University, 2017. Educating high school students on robotics.

Skills
- Machine Learning
  - Tensorflow/tensorflow lite
  - Pytorch
- Computer Vision
  - OpenCV
  - Open3D
- Data
  - Numpy
  - Scipy
- Simulation
  - Gazebo/ROS
  - Solid modelling using Onshape for robotics prototyping

Education
- PhD (ME) – Iowa State University (Information fusion for decision making)
- MS (COMS) – Iowa State University (Few Shot Clustering for Indoor Occupancy Detection with Extremely Low Quality Images from Battery Free Cameras)