Gokul H

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Education

B.E. Electrical and Electronics,
SSN College of Engineering (SSNCE), Anna University | 2019 | GPA: 8.41/10.0

Class XII,
Doveton Matriculation Higher Secondary School | 2015 | 98.0 %

Class X,
Doveton Matriculation Higher Secondary School | 2013 | 96.8%

Skills

Languages: Python | C++ | C | Matlab | Basics of Linux and C#.

Others: Pytorch | Keras | TensorFlow | LaTeX | MS Office | Git | Adobe Photoshop.

Extra-Curricular

Teaching Assistant @Solarillion Foundation(SF)
- Teaching Machine Learning using Python and Embedded C for juniors.
- Mentoring students in undergraduate research and paper writing..

Teaching Assistant @ S4S Project Lab, SSNCE Electronics Department
- Taught PCB designing with Eagle and Arduino Programming for juniors.

Stage Crew Head @ Lights Out Please, SSN English Theatre art Club
- Managed Stage Setups and crew teams for 8 English theatre plays.

Ongoing Research

Since Dec'19 — Practically implementable Adversarial attacks. — SF

- Currently, we are investigating adversarial attack patches on optical flow based Video Action Recognition architectures in Surveillance datasets.
- Our efforts to defend with adversarial training has given a good trade-off in classification results to improve robustness, and we are currently undertaking rigorous cross-testing procedures to validate our hypothesis in both black-box and white-box conditions.

Research Publications

May'19-Sep'19 — Gait Recovery System for Parkinson's Disease using Machine Learning on Embedded Platforms. — SF

- Lead author of this paper.
- Involves optimal designing of a signal feature extraction engine, pipelined to a 2KB Edge-ML model to deploy in microcontrollers.
- Achieved a 1.3% efficiency trade-off with 400 times model size compression compared to state-of-the-art.
- Accepted by 14th IEEE SYSCON 2019, Montreal, Canada.(https://arxiv.org/abs/2004.05811)

Aug'18-Feb'19 — Low-Cost Wearable Gesture Recognition System with Minimal User Calibration for ASL — SF

- Proposes a rule-based decision system for a sensor-embedded, easy user-adaptable sign-language interpreting glove.
- Published by 12th IEEE iThings 2019, Atlanta, US. (doi: 10.1109/iThings/GreenCom/CPSCom/SmartData.2019.00185)

Jan'19-Mar'19 — Design of Imitative Control Modalities for a 3-DoF Robotic Arm — SSNCE

- Designed inertial sensor (IMU) based and mono-vision based motion-tracking systems to interface with a 3-DOF robotic arm.
- Addresses 3D object-motion tracking, Inverse kinematics solutions, and Fitt's targeting experiments.
- Accepted by 4th IEEE ICCCSP 2020, Chennai, India.

Projects

Apr'19-Jun'19 — EMI-RNN - Faster Recurrent networks for sensor data patterns — SF

- Study of Recurrent Neural Networks(RNN) incorporated with Early prediction & Multiple Instance Learning (EMI) concepts vs standard RNN counterparts.
- On-device testing results with Raspberry Pi, showed several 100ms lower latency without compromising in efficiency, thus improving device scalability of RNN models.

Feb'19-Apr'19 — Solving Device Heterogeneity in Phone Activity recognition (AR) — SF

- Accelerometer signal-preprocessing with decimation and wavelet transform techniques, trained in an LSTM- CNN stacked neural network architecture to tackle device heterogeneity problem in AR.
- User adaptability was improved with transfer-learning techniques.

Oct'17-Nov'18 — Object Recognition Bot — SSNCE

- Prototype real-time Object-Tracking Monocular Robot.
- Was designed for further improvisation to a Mono-vision SLAM (Simultaneous Localization and Mapping) project with ORB-SLAM algorithm.

Awards

Oct'18 — Innovator of the Year 2017-2018 by IEEE ComSoc

- Proposed a study on feasibility and profitability for a futuristic non-invasive emotion sensing application for music industry.