Nikhil Venkata Saisantosh Podila

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EDUCATION:

Master of Science (M.Sc. Thesis) in Electrical Engineering, Sep 2019 – current
McGill University, Montreal, Canada
Courses: Applied Machine Learning, Reinforcement Learning,
Optimization and Optimal Control, Mathematical Foundations for Systems,
Probability and Random Processes 2
Current GPA: 3.87 out of 4

Bachelor of Engineering (B.E.) in Electrical and Electronics Engineering, Aug 2013 - Jun 2017
PES Institute of Technology, Bangalore, India
CGPA: 9.37 out of 10

PROJECTS:

- **Projects for COMP 551 and COMP 767 courses** Oct 2019 – Apr 2020
  - McGill University
  - COMP 551 Applied Machine Learning: Linear, Text and Image (Ensemble CNNs) classification, GANs
  - COMP 767 Reinforcement Learning: Final project – Review of Importance Resampling for Off-Policy Prediction

- **Reinforcement learning algorithms applied to optimization and control problems** Jan 2017 – May 2017
  - Mentor: Prof. Koshy George, PES Institute of Technology
  - Implemented **multi-armed bandits, dynamic programming and monte-carlo methods** for solving optimization problems such as Jack's car rental problem.
  - **Tabular and Function approximation RL** methods applied to the problem of cart-pole balancing.
  - Integrated Inverted Pendulum swing-up (Energy method) and stabilization (RL methods), and obtained 40% faster convergence over classical control methods

- **Control of Inverted Pendulum** Aug 2016 - Dec 2016
  - Mentor: Prof. Koshy George, PES Institute of Technology
  - Hybrid non-linear control design for the inverted pendulum problem
  - **Energy method** for swing-up control and **LQR** for stabilization
  - Simulated results for various initial angles and velocities on MATLAB and Simulink

- **Feature Extraction and Computer Vision** May 2016 - Dec 2016
  - Mentor: Prof. Koshy George, PES Institute of Technology
  - Implemented image feature extraction algorithms - **SIFT, SURF** - from scratch in MATLAB
  - Research and implementation of **Fast Appearance Based Mapping** with SURF

- **Iris Detection and Localization using Computer Vision** Jan 2016 – May 2016
  - Mentor: Mrs. Susmita Deb, PES Institute of Technology
  - Developed boundary detection algorithm for the iris using hough transform
  - Applied SIFT and SURF feature extractors to detect features in iris.

PROFESSIONAL EXPERIENCE

Data Scientist, **ABB Drives R&D** Feb 2017 – Jul 2019

- Developed various Proof-of-concepts for Electric Drives:
  - Detection of **operational anomalies** using Local Outlier Factor and Clustering.
  - **Lifetime estimation** using neural networks and LSTM
  - **Fault prediction** using decision trees and random forest
  - **Dust Detection** using Convolutional Neural Networks
- **Pilot** of operational anomalies algorithm. Interacted with clients and stakeholders for feedback and improvement.
- Developed **signal data preprocessing** methods using transient detection and PCA based dimensionality reduction
- PySpark and R implementations on **Azure** DataBricks, HDInsight and Data Lake Analytics.

Graduate Teaching Assistant, **McGill University** Jan 2020 – May 2020

- **TA for ECSE 324 Computer Organization (Instructor: Prof. Christophe Dubach)**
- Performed Lab experiment demoing using Altera ARM DE1-SoC board.
- Guided students to perform the lab experiment, obtain outputs and fix errors and bugs.
- Graded Lab demos presented by students.

SKILLS AND COURSES

Programming	Python, R, MATLAB, SQL, C++
Softwares/Libraries	TensorFlow, Keras, OpenCV, Azure suite (Data Lake Analytics, DataBricks, ML Studio, HDInsight), PyTorch, PySpark, Spark, Simulink
Online Courses	**Control of Mobile Robots** (GaTech, Coursera), Machine Learning (Coursera), Robotics – Perception (UPenn, Coursera), Reinforcement Learning (David Silver, UCL), Convolutional Neural Networks (Stanford), Reinforcement Learning (NPTEL, IIT-Madras)
Workshops	Complexity of Algorithms (UT Dallas), Image detection - YOLO algorithm (MLBLR), ML at scale using Spark (Analytics Vidhya), Agile (ABB), Data Structures in C++ (high school)

PATENTS AND PUBLICATIONS:

- Co-authored and presented paper titled: "*Comparison of reinforcement learning algorithms applied to the cart-pole problem*" (DOI: 10.1109/ICACCI.2017.8125811) — IEEE ICACCI, India Sep 2017
- Co-inventor of patent filed "METHOD AND SYSTEM FOR MONITORING CONDITION OF ELECTRIC DRIVES" — ABB Schweiz AG Aug 2018
- Co-inventor of patent filed "ANOMALY DETECTION SYSTEM AND METHOD FOR ELECTRIC DRIVES" — ABB Schweiz AG Oct 2018
- Co-authored paper titled: "*Star Sensor Design: Interface Circuit and VHDL Implementation on FPGA*" at National Sensors 2016 Conference — RCI, DRDO, India Jan 2016

AWARDS AND ACHIEVEMENTS

- Spot award in Drives division for outstanding value delivery and invention filing — ABB, Sep 2018
- Among top 10 best performers in B.E. Electrical and Electronics Engineering — PESIT, Jul 2017
- Led a team and obtained second prize worldwide at the NASA AMES Space Settlement Contest. Presented project results at the International Space Development Conference, Huntsville, AL, USA — Huntsville, AL, USA May 2011