1117 Anthrop Dr, #4
West Lafayette IN 47906
www.ksivasan.com

Kumaraguru Sivasankaran

+1-765-606-1594
ksivasan@purdue.edu
linkedin.com/in/ksivasan/

Education

West Lafayette, USA **PURDUE UNIVERSITY** **December 2018**

- Masters in Aeronautics and Astronautics Engineering. Major: Dynamics and Control. GPA: 3.88/4.
- Minor in Computational Science and Engineering.
- Graduate certificate in Applied Statistics.
- Focus areas: Modern Control theory, Optimization, Deep Reinforcement learning, Computer vision, Robotics.

Chennai, India **COLLEGE OF ENGINEERING GUINDY, ANNA UNIVERSITY** **Aug 2010 – May 2014**

- Bachelors in Mechanical Engineering. GPA: 9.4/10. (Ranked 3^{rd} in overall batch)

Technical skills and Exposure

Languages	Python, MATLAB, C, Unix, C++
Statistical tools	R, SAS, SAS Enterprise miner, Tableau
Parallel Computing	OpenMP, MPI, CUDA
Controls	Simulink, CVX, ROS
Libraries	Scikitlearn, Tensorflow, Keras, PyTorch, OpenCV, OpenAI gym, Jupyter

Professional Experience

Field Service Manager (F.T) **DAIMLER TRUCKS ASIA** **July 2014-July 2016**

Roles and Responsibilities: Technical support and Troubleshooting, Field product support, New product monitoring, Warranty management, Service marketing, CSI activities, Dealer management, 24*7 Customer care

- Managed technical support to 13 models of BB trucks ranging 9-49 tonnes with 200+ customers in the region.
- Conducted on-road fuel efficiency tests in the new range of BB trucks (3723R) for establishing performance.
- Over 200 hours of hands on experience with vehicle troubleshooting using onboard diagnostic (OBD) tools.
- Performed Business Intelligence (BI) analytics on 30000+ vehicle data using Oracle BI and created automatic reports for tracking Service measures, Spare parts availability, Warranty cost reduction for my region.
- Handled training and support to 10+ key accounts and participated in Sales discussion for ensuring repeat sales.

R&D, Intern **VOLVO GROUP TRUCKS, USA** **Aug 2017-Dec 2017**

- Performed OBD compliance tests by inserting faults and verifying the Diagnostic Trouble Codes (DTC) for Production Vehicle Evaluation (PVE). Used ATI Vision, CANAnalyzer for data acquisition and diagnosis.
- Collaborated with functional owners for resolving failures detected in SAE J1699-3 test conducted to meet California Air Resource Board (CARB) certification requirements.
- Assisted in improving the fidelity of powertrain model developed in Simulink for creating Virtual Test Cell. Used MATLAB DataView to study the powertrain performance and In Use Monitor Performance Ratio (IUMPR).

Research Experience

Advisor: Professor Xiao Wang **DEPT. OF STATISTICS** **Jan-Dec 2018**

- Exploring the idea of aggregation from a distributional perspective for vision based control applications.
- Currently focused on extending the success of Hierarchical Reinforcement learning and Bayesian optimization.
- Investigating algorithms for improving sample efficiency and computational efficiency through abstraction.
- Reviewed the state-of-the-art literature in the domain of deep reinforcement learning for end-to-end learning.

Academic projects

Dynamic systems and Control

- **Reinforcement learning for Control of Microrobots** through Local Potential Fields (2018): Employed RL algorithms including SARSA, Deep Q-learning for an optimal path problem in stochastic environments.
- **Decentralized control** (2017): Designed a hybrid distributed controller using Target point control approach for a two agent case as an approach towards decentralized autonomous traffic control.
- **Optimal path planning** (2016): Developed a Genetic Algorithm based robust optimal path selection program for Unmanned Aerial Vehicles (UAV) and compared the performance against A* algorithm in MATLAB.

Machine learning

- **Decision support tool** (2017): Improved the accuracy of a decision support system to 85% which is developed to assist air traffic controllers to issue conflict resolution. Implemented using Multi-class SVM and Ensemble models in MATLAB.
- **Recommendation system** (2017): Studied the state-of-the-art algorithms in the area of non-negative matrix factorization (NMF) and implemented SGD based recommendation system in Python using Surprise library.
- **Parallel computing** (2018): Comparison study on various parallel architectures including multi-GPU multi-CPU for a classic n-body problem using OpenMP, MPI, CUDA.
- **Bayesian inference** (2013): Studied parameter estimation for an unsteady heat transfer problem using Bayesian inference. Developed a MATLAB program to analyze the effect of a priori model on the performance of the Markov Chain Monte Carlo algorithm using Metropolis Hasting sampler and Gibbs sampling at different noise levels in the measured data.

Deep learning

- **Object detection** (2017): Implemented YOLOv2 algorithm for car detection, the then state-of-the-art object detection algorithm using Convolutional Neural Networks.
- **Transfer learning** (2017): Implemented a Neural Style Transfer algorithm using pre-trained weights from VGG-19 network to create artistic style images (similar to Prisma app).
- **MIT DeepTraffic** (2018): Hyper-parameter tuning in deep reinforcement learning to drive a multi-agent vechile system under simulated environment using DQN algorithm. Highest Ranking 848* out of 20981 (while active).

Short Term Courses, MOOCs and Certificates

2018 Fundamentals of Accelerated Computing with CUDA, Deep learning Institute, NVIDIA
2018 Deep learning Specialization by Prof. Andrew Ng, Stanford University (4/5 completed)
2018 Reinforcement learning by Prof. David Silver, UCL
2018 Modern Performance Based Navigation Systems by Dr. Ivan Ostroumov, Fulbright Scholar
2017 Introduction to Statistical Machine Learning using R by Prof. Trevor Hastie and Prof. Rob Tibshirani
2017 Probabilistic Graphical Models by Prof. Daphne Koller, Stanford University (2/3 completed)
2016 Control of Mobile Robots by Prof. Magnus Egerstedt, Georgia Tech

Service, Leadership and Awards

- **Project Manager, Minority Engineering Program**, Purdue University (June-July 2018): Mentored a class of 30 incoming freshman to Design, Test, Race a go-kart as part of Summer boot camp. Designed the curriculum and class exercises, managed logistics, provided individual feedback on final report.
- **President, Students Quality Club**, Anna University (2013–2014): Managed the overall activities of the club and handled funds worth INR 1 million for various activities like guest lectures, industry visits, workshops, value addition programs and quality circles. Headed a team of 200+ active members and mentored incoming juniors.
- **The Banco Foundation Prize:** Awarded for consistent academic performance for the year 2012-2013.
- **Central Sector Merit Scholarship:** Awarded by Ministry of HRD, Govt. of India for academic excellence.