



🖉 Machine Learning - Specialty 🛛 📀 Big Data - Specialty

Developer - Associate

# Kalyan Ram Kanagala

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#### **EDUCATION**

B.S. Computer Science, University of Maryland, College Park (August 2019)

Relevant Courses: Introduction to Artificial Intelligence, Computational Methods, Algorithms, Applied Statistics, Complex Analysis, Organization of Programming Languages, Computer and Network Security, Computer Architecture, Introduction to Data Science, Introduction to multivariable calculus, Operating Systems.

Extracurricular Activities: UMD AI Club, UMD Cybersecurity Club, Big Red Hacks'17, YHacks'17

## **ADDITIONAL SKILLS**

Programming Languages: C, C++, Python, SQL, JavaScript, OCaml, Prolog Deep Learning Frameworks: NumPy, TensorFlow, MATLAB, Keras, Pandas, Scikit-Learn, Matplotlib, PyTorch, Pyro, GPytorch, PyMC Web Frameworks: NodeJS, ReactJS Databases: MongoDB, PostgreSQL, DynamoDB

#### **CERTIFICATIONS**

- AWS Certified Developer Associate (Jan 2020-2023)
- AWS Certified Machine Learning Specialty (Jan 2020-2023)
- AWS Certified Big Data Specialty (Feb 2020-2023)

#### WORK EXPERIENCE

• Research Engineer **Employer: Georgetown University Client: Building Energy and Environment Division** NIST, Gaithersburg, MD

June 2020 – Present

- Thermal Energy Storage (TES)/Ice Tank Model: Developed four different statistical/machine learning models to model the relation between initial ice inventory, cumulative load, and the final ice inventory after the load is met.
  - Performed comprehensive study to analyze tradeoffs between all the models in terms of model complexity, amount of data needed, convergence properties, and accuracy.
  - Models built include Neural Nets, Regression, Gaussian Process, and Interpolation.
  - RMSE of these data-driven models is lower by about 40% that of the existing physics-based model.
- Chiller Model: Defined a probabilistic framework to model the relation between power consumed by the chiller given the sensor readings for the inlet temperature, flow rate, and the

setpoint temperature.

- Models built include Deep Gaussian Processes, Neural Nets, and Regression.
- Used Stochastic Variational Inference for Deep GPs
- **Time Series Modelling of TES:** Performed time series modeling to model the time series data generated by TES.Developed Vector auto-regressive, Bayesian Vector Autoregressive and Recurrent Neural Networks and used NUTS sampler in PyMC to train Bayesian VAR.
- Weekly meetings with the PI on project progress
- Three Technical Publications documenting the work in progress.
- Lab Website:

https://www.nist.gov/el/energy-and-environment-division-73200/intelligent-buildings-agents-l aboratory-ibal/about/people

#### Programmer Analyst

#### Dec 2019 – May 2020

## IQ Systems Inc.

- Learned about the software development lifecycle and common software practices.
- Built automation scripts for common AWS tasks using Boto3 SDK.

## PROJECTS

## Feedforward and Convolutional neural network for Fashion-MNIST

- Trained feedforward and convolutional neural networks using momentum-based methods like Nesterov, Adam, and RMSProp on the Fashion-MNIST dataset.
- Used TensorFlow as the backend and Keras as the front end.
- Achieved 93% accuracy with Convolutional Neural Net.

## Groceries expiration notifier

- Designed and developed a computer vision-based application from scratch in Python using Amazon Rekognition, CloudWatch, S3, MySQL database, AWS Lambda, and Simple Email Service(SES)
- The application takes an image of a grocery item as input, detects the "Best Before" date, and stores it in a MySQL database.
- Configured a Cron expression in CloudWatch to invoke the target lambda function periodically. The lambda function uses the AWS SES to notify users of grocery items that expire in the next three days.

#### Advice Taker program - Common Sense Reasoning

- Built an advice-taker program that accepts a set of facts and updates its knowledge base using the transitive inference rule. John McCarthy initially proposed this in his "Programs with Common Sense" paper, and we implemented a miniature version of it in Python.
- We also extended the knowledge base's functionality to store facts about images.
- Used pre-trained Convolutional Neural Network to classify images from the CIFAR dataset.
- Used Tensorflow to classify images and Breadth-First search algorithm to retrieve facts from the knowledge base.

# **CONFERENCES AND WORKSHOPS**

- Reviewer for Montreal AI Symposium 2022
- Attendee: Machine Learning for Materials Research Bootcamp 2022, ALT Mentorship Workshop 2022, COLT Mentorship Workshop 2021, Neurips Bayesian Deep Learning Workshop 2020

## **PROFESSIONAL MEMBERSHIPS**

- NIST AI Community of InterestReading Groups: Causal Inference, Graph Neural Networks