

Ramaswamy Iyappan

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EDUCATION

- **George Mason University** Fairfax, VA
Masters in Computer Science; GPA: 3.67 *Expected - Dec 2023*
- **Vels University** Chennai, India
Bachelor of Computer Science *2016 - 2020*

SKILLS

- **Programming:** C, Java, Python, PyTorch, MySQL, HTML-CSS, JavaScript/TypeScript, Angular, jQuery, AJAX, JSON, Linux, XML, GIT, and YAML
- **DevOps:** Kubernetes (Rancher), kubectl, Docker, RESTful Web Services, AWS-S3, AWS-EC2, Amazon RDS, Springboot, Jenkins, Amazon Route 53
- **Tools & Technologies:** Visual Studio Code, Eclipse, Google COLAB, GitHub, Jupyter Notebook, Postman, StarUML, Spring Tool Suite, MS Office, Matlab

COURSE WORK

- **Mathematics:** Mathematical Foundations of CS, Differential Calculus, Linear Algebra, Statistics and Probability
- **Computer Science:** Data Mining, Machine Learning, Advanced NLP, Fundamentals of Systems Programming, Software Design & Architecture, Analysis of Algorithms, Object Oriented Programming, Data Structures, MySQL, Component-based software development and World Wide Web Development

ACADEMIC PROJECTS

- **Machine Learning**
 - **Credit Card Fraud (Anomaly Detection):**
Implemented a Machine Learning approach using ensemble learning models such as Random Forest (Bagging), XG Boost (Boosting), Voting Classifier, and Multi-layer Perceptron (ANN) to identify fraudulent transactions. Addressed class imbalance through Under-sampling and Over-sampling techniques. (Dec '22)
 - **Digits Classification (Deep Learning):**
Developed a Feed-forward Artificial Neural Network using PyTorch to classify hand-written digits 2 and 9. Explored different activation functions (Sigmoid, ReLu, Tanh), mini-batch training, and hidden-layer settings. (Nov '22)
 - **Spam Classifier (Generative Model):**
Implemented a Naive Bayes classifier from scratch to identify Spam emails using Multinomial event model and Laplace Smoothing. (Oct '22)
 - **Hand-written digits Prediction (Unsupervised Learning):**
Implemented K-Means Clustering from scratch to classify hand-written digits 0-9. Utilized elbow-plot and PCA for dimensionality reduction. (Apr '22)
 - **Heart-Disease Prediction (Supervised Learning):**
Developed a Logistic Regression model using Gradient Descent from scratch to detect heart disease in patients. Compared results with Sci-kit Learn classifier. Found optimal trade-off between parameters which improved accuracy. Explored concepts such as Over-fitting, Complex models, and Bias-Variance Trade off. (Feb '22)
- **DevOps**
 - **Feedback Survey Form:**
Designed an interactive survey form with Angular, TypeScript, and RESTful Web services in Spring Boot for gathering feedback from prospective students. Demonstrated understanding of Cookies, Angular components, data storage/retrieval, RESTful calls, and Type-scripting for Angular. (Nov '22)
 - **Containerization and Deployment of a Web Application:**
Containerized a Survey-form web application using Docker and deployed it in a Rancher Kubernetes Cluster with AWS EC2 instances to enable scalability and resiliency. Designed a CI/CD pipeline using Jenkins and GitHub for automated build and deployment. Technologies used: HTML, CSS, JavaScript, YAML, Docker, Jenkins, AWS-EC2, Kubernetes, and Linux commands. (Apr '23)
 - **Microservices-based Application:**
Implemented a microservice application (Survey-form) using SpringBoot, Angular, Eclipse, RESTful Web Services, and JPA/Hibernate along with AWS-EC2, Amazon Relational Database Service (RDS) and MySQL to read and persist submitted Form data. Deployed the application on Rancher platform using Docker and a CI/CD pipeline. Tested and connected to the containerized microservice using Postman. (May '23)

• NLP

- **minBERT:**
Implemented BERT from scratch in PyTorch framework using Stanford Sentiment Treebank (*SST*) & *CFIMDB* datasets. Explored concepts such as Transformer, Attention mechanism, BERT-layer, encoder-decoder, pretraining, and fine-tuning. Inspired by the papers "*The Annotated Transformer*" and "*Illustrated BERT*". (Feb '23)
- **Sentence Classification from scratch:**
Created a Dataset by collecting sentences on Immigration & same-sex marriage and annotated examples manually. Compared results from different pretrained models and fine-tuned a *distilBERT* model to identify the framing of each sentence in several languages. Performed Data Augmentation to improve performance on the test set. (Mar '23)
- **Event Argument Extraction:**
Reproduced the baseline model (*mT5-base*) from an ACL paper *X-GEAR* to achieve zero-shot cross-lingual event argument extraction using multilingual pre-trained generative language models. Utilized the *ACE-2005* dataset and fine-tuned pre-trained models to fill-in language agnostic templates, effectively encoding event structures and capturing dependencies between extracted arguments. (May '23)

EXTRA-CURRICULAR

- Part-time Manager On Duty & Customer Service Assistant at Mason Recreation, GMU, since June 2022.
- Passionate Piano and Music Instructor since 2017, teaching for over 5 years.
- National Cadet Corps (Student military) participant, awarded for clearing Rifle rounds and camps in 2013, India.
- Continuous self-learning to stay updated and refresh knowledge by constructing solutions from scratch.
- Dedicated to understanding new technologies and solving real-world challenges through practical application of concepts.

HONORS AND AWARDS

- Achieved comprehensive proficiency in Piano by completing all 8 Grade exams under *Trinity College of Music*, London, in 2019.
- Recognized as the Marketing department's *Employee of the Year* in 2023 at Mason Recreation for exceptional contributions to team success and outstanding performance.
- Awarded the prestigious "*All Hands on Deck*" award in 2023 at Mason Recreation for demonstrating exceptional teamwork, resourcefulness, and initiative in the Marketing department.
- Received the esteemed "*Key to the REC center*" award in 2023 at Mason Recreation for delivering exemplary customer service, consistently exceeding expectations and fostering a positive environment.
- Honored with the *Employee of the Month* title four times in 2023 at Mason Recreation, highlighting unwavering commitment, dedication, and the ability to consistently deliver outstanding results.