

# Vignesh Kumar Karthikeyan

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Boulder, CO, USA

## EDUCATION

<b>University of Colorado Boulder</b> Master's in Computer Science with Specialization in <b>Artificial Intelligence</b> (CGPA : 3.96/4.00) <b>College of Engineering Guindy, Anna University</b> B.E in Computer Science and Engineering - <b>First Class with Distinction</b> (CGPA : 3.45/4.00)	<b>Boulder, USA</b> <b>Aug 2023 – May 2025</b> <b>Chennai, India</b> <b>Aug 2019 – Apr 2023</b>
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## SKILLS

**Technical Expertise:** Machine Learning & AI, NLP, RAG, Data Science & Analysis, Software Engineering & Deployment  
**Programming Languages:** Python, Java, R, C/C++, Shell Script, JavaScript, TypeScript, SQL  
**AI & Machine Learning:** Azure AI Services, IBM WatsonX, AWS Bedrock, SageMaker, Google Cloud AI Platform, Vertex AI  
**Cloud Computing, Storage & Big Data:** Azure, AWS, Google Cloud Platform, IBM Cloud, Hadoop, Apache Spark  
**Databases, ETL & Data Engineering:** MySQL, Firebase, IBM DB2, Azure Synapse, PostgreSQL, Vector Databases (FAISS, Pinecone), Tableau, Power BI  
**Virtualization & Containerization:** Docker, Kubernetes, Terraform, Hyper-V  
**Developer Tools:** Prompt Engineering, Jupyter, VS Code, PyCharm, IntelliJ, GitHub, Git, Jira, Agile (Scrum, Kanban)  
**Certifications:** Microsoft Azure AI Engineer Associate, IBM Enterprise Design Thinking, ToastMasters Presentation Mastery 1

## EXPERIENCE

<b>AI/ML Engineer - Professional Master's Capstone Project</b> <b>Alliant National Title Insurance Co. - University of Colorado Boulder</b> <ul style="list-style-type: none"><li>Implementing an Azure based AI-driven Named Entity Recognition (NER) system, automating data extraction from legal documents within a structured SDLC framework. Collaborating in a cross-functional team, contributing to weekly sprint meetings, resolving technical blockers, and designing a responsive query interface to improve document retrieval efficiency</li></ul>	<b>Sep 2024 – Present</b> <b>Boulder, USA</b>
<b>MSCS Course Facilitator</b> <b>University of Colorado Boulder - Coursera</b> <ul style="list-style-type: none"><li>Served as the primary point of contact for 120 students, conducting regular online office hours to resolve course-related questions and manage course support by ensuring timely responses via <b>Salesforce</b>. Facilitating courses covering <b>Data Mining, Machine Learning, and Deep Learning</b>, providing guidance on key concepts and technical problem-solving</li></ul>	<b>Apr 2024 – Present</b> <b>Boulder, USA</b>
<b>Data Automation and Entry Technician</b> <b>University of Colorado Boulder - Facilities Management</b> <ul style="list-style-type: none"><li>Built a Python-based automation solution to extract data from HVAC related documents, reducing manual data entry. Integrated Selenium for web-based automation, reducing processing time by 95% and saving approx. \$1,000 weekly</li></ul>	<b>Oct 2023 – Apr 2024</b> <b>Boulder, USA</b>
<b>Undergraduate Technical Intern</b> <b>Intel Corporation</b> <ul style="list-style-type: none"><li>Developed a Python-based automation system to extract JSON data from 70,000 devices via REST APIs, reducing processing time by 90% and enhancing pipeline efficiency, stability, and reliability. Currently in use with Intel Employee devices in the United States, Israel, Malaysia, and India. Collaborated in an Agile Scrum team, participating in sprint planning, daily stand-ups, and retrospectives while developing automation and data extraction pipelines, ensuring smooth integration and continuous improvements</li></ul>	<b>Jan 2023 – Jun 2023</b> <b>Bangalore, India</b>

## PROJECTS

<b>AI-Powered Financial Research Chatbot: Python, RAG, FastAPI, Next.js, Google Cloud</b> <ul style="list-style-type: none"><li>Developed and deployed an AI-driven financial research chatbot using <b>FastAPI (Python)</b> and <b>Google Gemini API</b> with <b>Retrieval-Augmented Generation (RAG)</b> to provide intelligent answers from financial reports and market data. Built a <b>Next.js (TypeScript)</b> frontend hosted on <b>Vercel</b>, and deployed the backend on <b>Google Cloud Run</b> with <b>Docker &amp; Artifact Registry</b>. Integrated <b>PostgreSQL (Cloud SQL)</b> to store chat history, optimized retrieval using <b>FAISS/Pinecone</b>, and implemented <b>Google Cloud Build CI/CD</b> for automated deployment</li></ul>
<b>Customer Churn Prediction &amp; Revenue Estimation: Python, Machine Learning, IBM Cloud</b> <ul style="list-style-type: none"><li>Built an ML pipeline to predict customer churn (96.1% accuracy) and estimate revenue, using <b>Logistic Regression, Random Forest, XGBoost (classification)</b> and <b>Linear Regression, Random Forest Regressor, XGBoost Regressor (regression)</b>. Optimized performance via <b>feature engineering, hyperparameter tuning (GridSearchCV, RandomizedSearchCV)</b>, and deployed a <b>Flask API</b> on <b>IBM Cloud</b>, integrating <b>IBM WatsonX</b> for training and <b>IBM COS</b> for model storage, enabling real-time predictions</li></ul>
<b>Wind Power Prediction using Ensemble Learning: Python, Deep Learning</b> <ul style="list-style-type: none"><li>Developed an Ensemble Model (Transformer, LSTM, GBDT) for <b>time-series wind power forecasting</b>, improving accuracy by 60% over traditional models and reducing <b>MAE by 58%</b> and <b>RMSE by 56%</b>, significantly enhancing prediction reliability</li></ul>

## LEADERSHIP & EXTRACURRICULAR ACTIVITIES

- Director of Cultural Events at **American Association of Engineers of Indian Origin (AAEIO) - CU Boulder Chapter**, hosting cultural events like Diwali 2024, New Year Festival 2024 for 1000 students at the university
- Awarded **2nd place** at **2017 International Teenage Design and Art Award** held in Busan, South Korea