Karthick Prasad Gunasekaran

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Summary

- Seasoned AI/ML research and engineering, with a specialized focus on deep learning techniques that drive substantial business value.
- Track record of leading complex research initiatives from problem to production, transforming theoretical concepts into scalable AI systems while driving strategic business alignment through effective stakeholder collaboration.

Experience

Senior Applied Scientist, Amazon Web Services (AWS) – Seattle, WA Feb 2021 – Present

I led multiple AWS AI/ML initiatives with significant business impact through research and product applications. My approach combined applied ML research with direct business solutions, resulting in multiple high-impact launches. My work encompassed:

ML & Recommendation System

- Led development of sales coverage recommender system using deep learning and causal inference, generating $244M in additional revenue through AB tested deployments
- Architected customer segmentation platform using semi-supervised learning, driving $51.1M incremental revenue, serving 100K+ customers
- Built and deployed production-grade ML pipelines processing 1M+ daily transactions with 99.9% availability

LLM Post training & production

- Led end-to-end development of domain-specific LLMs using RLHF and RAG, reducing 10,000 manual hours/month
- Designed autonomous agents with human-in-the-loop systems for AWS sales operations

Technical Leadership & Team Impact

- Mentored 5 junior scientists, establishing team-wide ML best practices and development standards
- Led cross-functional collaboration between ML, product, and engineering teams (18+ members)
- Defined multi-year science roadmaps aligning ML initiatives with business objectives

Machine Learning Engineer Intern, Amazon.com – Seattle, WA May 2020 – Sept 2020

- Contributed to the design and development of the personalized homepage recommendations engine on Amazon.com, which renders different widgets based on customer search and order history.

Machine Learning Engineer, Samsung Research India – Bangalore, India June 2017 – Dec 2018

- Developed a machine learning-based physical layer simulator for LTE systems, employing embedded random forest-based models to predict and optimize signal processing performance across cache hierarchies, resulting in 35% improvements in computational efficiency and a 20% increase in signal reconstruction accuracy.

Education

University of Massachusetts, Amherst, MS in Computer Science (GPA: 3.7/4) Jan 2019 – Dec 2020

- Research on few-shot learning, meta learning, large language model applications for biomedical domains, denoising ML approaches, and distribution.

Coimbatore Institute of Technology, India, B.Eng in Computer Science June 2013 – May 2017

- Graduated with honors.

Publications

Optimized Sales Resource Allocation by using Causal Machine Learning Oct 2024

Karthick Prasad Gunasekaran, Fang Fu, Brian Giera.,

Amazon Machine Learning Conference (AMLC), 2024

Towards an Explainable Machine Learning Approach for Selection Criteria Oct 2023
Karthick Prasad Gunasekaran
Amazon Machine Learning Conference (AMLC), 2023

Text2Time: Transformer-based article time period predictor Aug 2023
Karthick Prasad Gunasekaran, B Chase Babrich, Saurabh Shirodkar, and Hee Hwang
2023 IEEE 6th International Conference on Pattern Recognition and Artificial Intelligence (PRAI), August 2023

Diverse distributions of self-supervised tasks for meta-learning in NLP Nov 2021
Trapit Bansal, ***Karthick Prasad Gunasekaran***,Tong Wang, Tsendsuren Munkhdalai, Andrew McCallum
Empirical Methods in Natural Language Processing(EMNLP), 2021

Unsupervised Pre-training for Biomedical Question Answering Sep 2020
Vaishnavi Kommaraju, ***Karthick Prasad Gunasekaran***, Kun Li, Trapit Bansal, Andrew McCallum. Conference and Labs of the Evaluation Forum (CLEF) 2020

Now You See Me: Robust approach to Partial Occlusions Apr 2023
Karthick Prasad Gunasekaran, Nikita Jaiman. IEEE Pattern Recognition and Machine Learning (PRML) 2023

Ultra sharp: Study of single image super resolution using residual dense network May 2023
Karthick Prasad Gunasekaran et al., 2023 IEEE 3rd International Conference on Computer Communication and Artificial Intelligence (CCAI)

Defining the caprine $\gamma\delta$ T cell WC1 multigenic array and evaluation... Feb 2022
Alehegne W. Yirsaw, Alexandra Gillespie, Fengqiu Zhang, ... ***Karthick P. Gunasekaran***, ... Cynthia L. Baldwin Immunogenetics, 2022.

Characterization of the domestic goat $\gamma\delta$ T cell receptor gene loci and gene usage Jan 2021
Alexandria Gillespie, Al Yirsaw, ***Karthick P. Gunasekaran***, ... Cynthia L. Baldwin. Immunogenetics, 2021.

Gene characterization and expression of the $\gamma\delta$ T cell co-receptor WC1 in sheep Mar 2021
Alexandria Gillespie, Al Yirsaw, Sookyung Kim, ... ***Karthick P. Gunasekaran***, Janice Telfer, Cynthia L Baldwin Developmental & Comparative Immunology, 2021.

Leveraging object detection for the identification of lung cancer May 2020
Karthick P. Gunasekaran et.al, International Advanced Research Journal in Science, Engineering and Technology, 2020.

Exploring Sentiment Analysis Techniques in Natural Language Processing: A Comprehensive Review January 2019
Karthick P. Gunasekaran et.al, International Journal of Advanced Research in Computer and Communication Engineering (IJARCCE), 2019.

Technologies

Languages: Python, SQL, C++, Typescript.

Tools & Libraries: PyTorch, TensorFlow, Hugging Face, EconML, Scikit-learn, NLTK, SpaCy AWS SageMaker, Docker, MLflow, Pandas, OpenCV, OpenAI Gym, NumPy.