KARTHICK GUNASEKARAN

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EDUCATION

University of Massachusetts, Amherst **JAN 19 - DEC 20**
College of Information and Computer Sciences
Master of Science in Computer Science (3.71/4.00)
Specialization - Machine Learning

Coimbatore Institute of Technology **JUL 13 - MAY 17**
Bachelor of Computer Science and Engineering (8.11/10.0)

PUBLICATIONS

Diverse Distributions of Self-Supervised Tasks for Meta-Learning in NLP
(https://arxiv.org/abs/2111.01322) In Empirical Methods in Natural Language Processing (EMNLP), 2021.

- Proposed multiple self-supervised task distributions from unlabeled text, to enable large-scale meta-learning in NLP.

Unsupervised Pre-training for Biomedical Question Answering (https://arxiv.org/abs/2009.12952)
Conference and Labs of the Evaluation Forum, CLEF 2020 Thessaloniki, Greece

- Improved BioBERT, SciBERT models to build Biomedical QA system to answer different question types.

PROFESSIONAL EXPERIENCE

Amazon Web Services Inc **FEB 21 - PRESENT**
Applied Scientist

- Recommender System which helps sellers to help identify opportunities and prioritize their time.
- Time series similarity modeling with Siamese Network for identifying potential of AWS Startup Customers.
- Used Transformer Attention mechanism for Sales revenue Forecasting led to 15% performance improvement.
- Worked on Sales resource allocation for AWS using Double Machine Learning framework.
- Involved in end-to-end development from modeling to deployment.

Amazon Inc **MAY 20 - SEP 20**
SDE Intern

- Design and Development of Widget-Builder Framework using new Amazon's Internal platform to render different widgets on Amazon.com using React, Typescript.

Samsung Semiconductor India Research **JUL 17 - NOV 18**
Senior Engineer

- Design and development of LTE **Physical layer simulator** used for board bring ups .
- Performed **cache optimization** of LTE DSP code: Refactored, removed redundant code & performed ARM level optimization among L1, L2 and L3 cache regions which led to successful reduction of memory utilization and improvement in cache hit rate.

RESEARCH EXPERIENCE

I.E.S.L, UMass Amherst **SEP 20 - FEB 21**
Graduate Student NLP Researcher

- Implement unsupervised approaches to meta-learning in order to improve few-shot generalization of NLP.
- Evaluate multiple pre-trained models for few-shot generalization to new tasks and new domains.

I.E.S.L, UMass Amherst & Chan Zuckerberg Initiative **JAN 20 - MAY20**
Graduate Student NLP Researcher

- Developed a Bert based architecture and used BioSentVec emb for BioMedical Question Answering with CZI.

- Model saves huge time for medical practitioners from searching patient records and drug interactions.

Mosaic lab, UMass Amherst **MAY 19 - AUG 19**

Summer Graduate Student ML Researcher

- Developed a novel model with Prof. Tauhidur based **Multispectral Physiological Parameter Estimation**.

TECHNICAL SKILLS

Language: Java, Python, React, Typescript, C, SQL.

Tools and Libraries: PyTorch, Nltk,OpenCV, TensorFlow, HuggingFace,Scipy , Pandas, Perforce, Scikit, GIT, SpaCy.

PROJECTS

❑ **Modelling tags & publication dates of News articles** **AUG 19 - DEC 19**

- Developed a **BERT language model** based architecture for predicting the dates and categories of articles.
- The project helps in **auto tagging** for articles and predicting the original dates to find authors writing style.
- 20% more performance compared to baseline NaiveBayes, implemented in PyTorch with **HuggingFace library.**

❑ **Partial Occlusion in Autonomous vehicles** **AUG 19 - DEC 19**

- Created synthetic dataset by augmenting **different artifact** types with varying sizes on **Stanford Cars dataset**.
- Simulated various **experiments** understanding the partial occlusion scenario with state-of-the-art CNN models.
- Project helped in understanding the performance of networks under various uncertain environment.

❑ **Single Image Super Resolution** **AUG 19 - DEC 19**

- Developed a **Residual dense network** based architecture for Super Resolution of Images.
- Focused on **medical research** for pathological cancer slides and prostate tissue glands.
- Project supplements existing microscopes achieving a high resolution and maintaining a large field-of-view.

AWARDS & ACHIEVEMENTS

- Second Prize in BioASQ 8b Biomedical QA challenge.
- Recognized with **SPOT award** for my contribution to LTE DSP simulator at Samsung.
- Recognized with **"Employee of the month"** for my contributions at Samsung.
- Won First prize at hackathon event called "HACKCEPTION" at Amrita University, India
- Won Third prize at hackathon event called "HACKIN" at PSG college of Technology, India.
- Won Third prize at intra college coding event.
- Recipient of Vijayalakshimi trust merit scholarship, India.