Khai-Nguyen Nguyen

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Education

College of William and Mary — Virginia, USA
Graduate Student in Computer Science — 2023 - current
- Research area: Natural Language Processing, Machine Learning for Healthcare

Bucknell University — Pennsylvania, USA
B.Sc. in Computer Science and Engineering, minor in Statistics — 2019 - 2023
- GPA: 3.94/4.00

Publications

♣: *equal contribution*

1. Real-time Speech Summarization for Medical Conversations.
   Khai Le-Duc♣, **Khai-Nguyen Nguyen♣**, Long Vo-Dang, Truong-Son Hy
   Interspeech 2024
2. Getting away with more network pruning: From sparsity to geometry and linear regions
   Jeffrey Cai♣, **Khai-Nguyen Nguyen♣**, Nishant Shrestha, Aidan Good, Ruisen Tu, Xin Yu, Shandian Zhe, Thiago Serra
   CPAIOR 2023 & Workshop on Sparsity in Neural Networks, ICLR 2023
3. Important and Difficult Topics in CS2: An Expert Consensus via Delphi Study
   Lea Wittie, Anastasia Kurdia, Meriel Huggard, **Khai-Nguyen Nguyen**
   ASEE Annual Conference and Exposition 2023

Preprints

♣: *equal contribution*

1. Sentiment Reasoning for Healthcare
   Khai-Nguyen Nguyen♣, Khai Le-Duc♣, Bach Phan Tat, Duy Le, Jerry Ngo, Long Vo-Dang, Anh Totti Nguyen, Truong-Son Hy
   Submitted to EMNLP 2024
2. Medical Spoken Named Entity Recognition
   Khai Le-Duc, David Thulke, Hung-Phong Tran, Long Vo-Dang, **Khai-Nguyen Nguyen**, Truong-Son Hy, Ralf Schluter
   Submitted to AAAI 2024
3. Like a bilingual baby: The advantage of visually grounding a bilingual language model
   Khai-Nguyen Nguyen, Zixin Tang, Ankur Mali, M Alex Kelly
   arXiv, 2023

Presentations

Real-time Speech Summarization for Medical Conversations
Poster presentation at MASC-SLL 2024 & Oral presentation at Interspeech 2024

Like a bilingual baby: The advantage of visually grounding a bilingual language model
Poster presentation at Susquehanna Valley Undergraduate Research Symposium 2022 & Kalman Symposium 2022

Research Experiences

University of Illinois at Urbana-Champaign (UIUC), Illinois, USA
Remote Researcher. Mentor: Dr. Kevin Chenchuan Chang — 2023.09 - current
- Research the semantic gap between context-of-use-based queries and product descriptions in product search, and develop methods bridging this gap

FPT Software AI Center, Vietnam
Affiliated Researcher. Supervisor: Dr. Truong-Son Hy 2024.05 - current

- Developing the Multilingual Multitask Multipurpose Medical Speech Recognition (MultiMed) benchmark
- Collect and leverage **human reasoning** during dataset construction to improve sentiment analysis models' performance on ASR data (**+1% accuracy**) through chain-of-thought augmented distillation
- Designed a human-LLM collaborative annotation strategy to generate high quality synthetic data for medical dialogue summarization

Bucknell University, Pennsylvania, USA
Research Assistant. Mentor: Dr. Thiago Serra 2022.02 - 2023.03

- Developed a upper bound theorem on the **expressiveness** of piecewise linear layers in deep neural networks
- Implemented a **novel global magnitude pruning algorithm** based on the upper bound theorem, outperforming the state-of-the-art with an accuracy gain **up to 16.8%** on MNIST, FashionMNIST and CIFAR-10

Bucknell University, Pennsylvania, USA
Research Assistant. Mentor: Dr. Alex Kelly 2021.05 - 2022.08

- Improved language understanding of multi-lingual recurrent language models through multimodal training by incorporating visual grounding in language training

Relevant Experiences

CodaMetrix | Boston, USA 2024.05 - 2024.08

- Trained a ClinicalBERT-based LLM for ICD-10 classification, outperforming the current system-in-use **by 4% accuracy**
- Proposed a **novel BERT training technique** that leverages the hierarchical structure of ICD-10 and utilize ICD-10 category as guidance signal for ICD-10 classification

Cazoodle | Illinois, USA 2023.05 - 2023.08

- Developed a query expansion system that utilize LLMs to **comprehend user intent** for targeted keyword recommendation
- Built and deployed a feature-rich Django interface using ElasticSearch BM25 search engine for comprehensive end-to-end testing

Projects

Backplane Defect Detection
Bucknell University, USA 2022.08 - 2023.05

- Finetuned DenseNet and ResNet architectures for defect classification on 1000 training samples with class imbalance, achieving an **96.9% accuracy** and **0.96 F-1**
- Applied **GradCAM** to **localize defect** and improve model **interpretability** for users

Summarization and Lookup for Encoders
Bucknell University, USA 2022.04 - 2022.06

- Research on retaining maximum context of previous windows for the sliding window method in long sequence modelling by extracting the top-k tokens with highest attention scores as each window's summary

Awards and Honors

- **Recipient** Computer Science Fellowship, College of William and Mary 2023
- **Dean's List** Bucknell University 2019 – 2023
- **Recipient**, Program for Undergraduate Research Grant, Bucknell University 2021
- **Honorable Mention**, Mathematical Contest in Modeling 2020