

SHANGRAN QIU

Experience in search and ranking, look for roles that make impacts with data

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Experience

Microsoft – Applied Scientist 2

📅 Jun. 2022 – present

📍 Redmond, WA

- Worked on improving the relevance of Bing's image search vertical in collaboration with multimedia team.
- Leveraged both visual features from image and surrounding text features to accurately capture the semantic representation of an image.
- Implemented multiple contrastive-learning based methods to map query and image to a shared embedding space upon which search index can be built.
- Explored loss functions to distill knowledge from high dimensional embedding to a 7-times more compact embedding space while bridged more than 50% of performance gap between teacher and student.
- Boosted model performance by applying team-developed techniques, including hard negative sampling and a multi-stage training strategy.
- Identified the existence of false negatives in training data and designed loss functions to reduce the harmful gradient injected by false negative samples.
- Surfaced the root cause of observed discrepancy between recall and NDCG on sampled and full evaluation set respectively and revised the sampled set dynamically evaluated during training to better approximate end metrics.

Facebook – PhD Machine Learning Intern

📅 Jul. 2021 – Sep. 2021

📍 Remote

- Developed the support of knowledge distillation in video ranking team to improve video contents' recommendation.
- Significantly boosted current ranking model's normalized entropy up to 0.3% by distilling from external teacher model.
- Increased distillation efficiency by calibrating teacher model's predictions and landed this change to Facebook's ML backend.
- Deeply customized the external teacher model and contributed to an automated model logger that concurrently logs teacher's predictions into Hive.
- The impactful results were summarized in 3 articles that were published in Facebook internal communication channels.

Philips – Research Intern

📅 Mar. 2019 – Aug. 2019

📍 Boston, MA

- Designed and developed a user guidance algorithm for optimal positioning of handheld ultrasound probe.
- Achieved a deep learning prototype of the guidance system by detecting locations of predefined medical key-points.
- Built a data pipeline to congregate, parse, sanitize and augment data from various sources.
- Evaluated and fine-tuned the key-points detection algorithm and demonstrated clinically relevant accuracy.

Education

Doctor of Philosophy, Physics

Boston University

📅 Sep. 2016 – Jun. 2022

📍 Boston, MA

Bachelor of Science, Physics

Xi'an Jiaotong University

📅 Sep. 2012 – Jun. 2016

📍 Xi'an, China

Projects

PhD research at the intersection of ML and medicine; collaborated with physicians to integrate AI to dementia diagnosis

Diagnostic Tool for Dementia [paper] [code]

- Created a deep learning framework that can be used to diagnose various stages and distinct subtypes of dementia.
- Achieved accuracy on par with neurologists and broad diagnostic scope covering most patients in memory clinics.
- Leveraged SHAP interpretability method to attribute disease risk to fine structures in brain and other clinical measures.
- Consolidated data-driven findings against experts' domain knowledge using systematic statistical tests.
- Published in Nature Communications (IF=17.7).

Explainable AI for Alzheimer's Disease [paper] [code]

- Developed an explainable AI framework to predict 3D risk map of Alzheimer's disease on top of brain MRI.
- Framework's classification accuracy (96.8%) outperformed the average of 11 neurologists given same information.
- Published in Brain (IF=13.5) and was featured as one of Boston University's Top 5 Alzheimer's research breakthroughs.

Distributed File System (C++/C)

- Built a distributed file system where data change from any client will be synchronized to other clients through a central server.
- Managed **multi-threads** server-client communication using pthreads library following a boss-worker pattern.
- Supported file caching mechanism through **inter-process communication** to prevent repeated file downloading.

Skills

Foundation	data structure, database, operating system
Language	Python, C#, C++, C, SQL, Presto, Bash
Framework	Pytorch, Tensorflow, Keras, Caffe2, Spark
Tool	Git, Mercurial, Docker, VirtualBox
Statistics	stochastic process, statistical learning