Zhangqi (Gavin) Duan

Amherst, MA 01002 | 413-801-2087 | zduan@cs.umass.edu

EDUCATION

University of Massachusetts Amherst
- PhD in Computer Science, GPA: 3.81/4.0, Advised by Prof. Andrew Lan   Sep 2024 - (May 2029)
- MS in Computer Science, GPA: 3.82/4.0   Sep 2022 - May 2024
- BS in Computer Science & BS in Mathematics, GPA: 3.85/4.0   Sep 2018 - May 2022

WORK EXPERIENCE

UMass Amherst Center for Data Science | Machine Learning Engineer Intern | Amherst   May 2023 - Aug 2023
- Conducted data analysis on a dataset comprising 6.5 million tweets, identifying patterns and outliers
- Applied Python Numpy, Pandas modules to perform advanced data cleaning and feature engineering resulted in **23%** decrease in model runtime
- Built a Topic Model to categorize diverse topics, uncovering unknown events within Non-English textual data
- Implemented a User Model pipeline to target primary contributors to ongoing conversations with unsupervised learning algorithms(**Spherical K-means clustering, hierarchical clustering**)
- Designed a specific metric to evaluate the most pertinent terms associated with each discovered topic, contributed to **32%** enhancement in performance

Siemens Ltd, China | Intern at Corporate Technology Dept. | Beijing, China   May 2019 - Jul 2019
- Integrated recommendation system with web application by REST APIs, enhancing **20%** user engagement
- Conducted data collection and database creation for 10,000 clients using **SQL** Subqueries/Merge Statement
- Investigated and resolved technical issues reported by clients or detected through internal testing and monitoring
- Performed code reviews and provided feedback to team members

TEACHING EXPERIENCE

UMass Amherst College of Info. and Computer Science | Teaching Assistant | Amherst   Sep 2022 - Present
- Assisted in preparation of coursework, improving the learning experience for **200+** undergraduate students
- Led discussion section and office hours to help students understand material and concepts in lecture
- Assigned different tasks such as checking assignment and quiz correctness to other TAs and UCAs as head TA
- Developed and graded assignments and exams, ensuring a fair and consistent evaluation process for all students

RESEARCH PUBLICATIONS

- **Test Case-Informed Knowledge Tracing for Open-ended Coding Tasks**
  LAK 2025
  Zhangqi Duan, Nigel Fernandez, Alexander Hicks, Andrew Lan
- **Multilingualism, Transnationality, and K-pop in the Online# StopAsianHate Movement**
  WebSci 2025
  Tessa Masis, **Zhangqi Duan**, Weiai Wayne Xu, Ethan Zuckerman, Jane Yeahin Pyo, Brendan O'Connor
- **README: Bridging Medical Jargon and Lay Understanding for Patient Education through Data-Centric NLP**
  EMNLP 2024 (Findings)
  Zonghai Yao**,** Nandyala Siddharth Kantu, Guanghao Wei, Hieu Tran, **Zhangqi Duan**, Sunjae Kwon, Zhichao Yang, README annotation team, Hong Yu
- **Agent Performing Autonomous Stock Trading under Good and Bad Situations**
  ICLR 2023(Workshop)
  Yunfei Luo, **Zhangqi Duan**
- The Online #StopAsianHate Movement: More Global and BTS-Driven Than You'd Think
  New Directions in Analyzing Text as Data (TADA) 2023
  Tessa Masis, **Zhangqi Duan**, Weiai Xu, Jonathan Corpus Ong, Ethan Zuckerman, Jane Pyo, Brendan O'Connor

RESEARCH EXPERIENCE

Machine Learning for Education: Test Case-Informed Knowledge Tracing Model   May 2024 - Sep 2024
- Constructed the first test case-level dataset in knowledge tracing task, enabling more granular evaluation of student responses and model performance
- Developed TIKTOC, a novel **multitask model** using **Llama-3**, designed to handle both code generation tasks and predict test case-level correctness of student submissions

- Achieved a **5%** improvement in prediction tasks compared to single DKT model and a **3%** improvement in code generation tasks over OKT model, demonstrating the effectiveness of TIKTOC across diverse tasks

Web Application: Patient Portal System   Sep 2023 - Dec 2023
- Created a user-friendly Patient Portal System by **Next.js**, **FastAPI**, and **PostgreSQL**
- Fortified application security by incorporating security software development with JWT-based authentication
- Extended appointment reservation and document upload function, raising user engagement by **35%**
- Optimized API performance by employing state-of-art techniques, yielding **25%** improvement in response time

Reinforcement Learning: Autonomous Stock Trading   Feb 2023 - Jun 2023
- Constructed a trading agent capable of making data-driven investment decisions in a dynamic stock market
- Applied deep Q-learning, deep SARSA, and policy gradient algorithms with **PyTorch** for model evaluation
- Incorporated financial indicators to the MDP as additional features, resulted in **27%** enhancement in performance
- Obtained promising profit returns with total annual rates between 70% - 90% on different stocks in favorable market conditions and maintained positive profit returns in adverse market conditions

Biomedical Natural Language Processing: NoteAid Lay Definition Generation   Sep 2021 - Jan 2022
- Conducted research in biomedical NLP to improve communication efficiency between doctors and patients
- Proposed an algorithm to address lingual ambiguity after performing depth data analysis
- Applied **BART** and **bert2BERT** algorithms for pre-trained general embeddings to extract meaningful information
- Launched NoteAid Application to render translation version of doctor notes using **React.js** and **Django**

Web Programming: CG3 Blog Platform   Feb 2020 - May 2020
- Developed a web-based application that merged blogging platform and social media functionalities
- Constructed home page, login page, and post page using **React.js**
- Designed backend API with **Node.js** and **Express.js**, creating routes for user authentication and blog post creation
- Integrated **MongoDB** as database for storing and interacting with data

HONORS AND AWARDS
- Bay State Fellowship (Full Scholarship Sponsored by UMass CICS)
- Graduated Magna Cum Laude In MS from University of Massachusetts Amherst
- Graduated Magna Cum Laude In BS from University of Massachusetts Amherst
- Vice President of Chinese Student and Scholar Association
- Dean's List in all semesters

SKILLS
Python; Pandas; Numpy; Machine Learning Algorithms; Deep Learning; PyTorch; Tensorflow; NLP; Reinforcement Learning; R; React.js; Express.js; Node.js; Django; SQL; MangoDB; HTML; CSS; Data Visualization; Data Collection; Problem Solving; Planning and Scheduling