Duong Ta

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https://github.com/duongta155

EXPERIENCE

Doctoral Pre-Candidate, UMBC Department of Computer Science and Electrical Engineering   Recent
Supervised by Dr. Tim Oates on Large Language Models and Metacognitive Prompting
- Utilized GPT-3.5-turbo and metacognitive techniques to create mathematical and logical reasoning prompts that enabled the model to provide step-by-step solutions.
- Engineered GPT-3.5-turbo prompts to evaluate the given step-by-step math and reasoning solutions against reference solutions from corresponding solvers, improving the model's accuracy on these evaluation tasks.

Big Data Engineer, CMC Institute of Science and Technology   May 2021 - Aug 2022
Supervised by Thai Doan on B2B matching algorithms.
- Implemented Random Walk with Restart algorithm for ranking top similar companies to the query company.
- Improved ranking time with knowledge graph embedding models and hierarchical navigable small word search algorithm.
- Analyzed clustering and segmenting machine learning algorithms such as K-means neighboring or decision tree.

EDUCATION

Ph.D Computer Science, University of Maryland, Baltimore County   Recent
GPA: 3.94/4.0

B.S. Computer Science, Villanova University   2021
Magna Cum Laude

SERVICES

Teaching Assistant, UMBC Department of Computer Science and Electrical Engineering   since 2022
- Graded 4 students' assignments and held office hours for CMSC 678 - Introduction to Machine Learning of Dr. Frank Ferraro
- Graded 4 students' assignments, mid-term exam and held office hours for CMSC 673 - Introduction to Natural Language Processing of Dr. Frank Ferraro

Research Assistant, CORAL   May-Aug 2023
- Constructed 15 multi-agent and graph reinforcement learning papers to conceptualize the system.
- Analyzed 3 graph reinforcement learning domains, including transportation, coach management, and job scheduling.
- Launched the Graph-CAVs model and interpreted the result for the multi-agent decision-making in autonomous traffic.

NL2SQL Programmer, Big Data & AI Lab in CMC CIST   Sep-Oct 2021
- Built a Vietnamese transaction dataset and tokenized the query question and SQL statement.
- Launched Data-Agnostic Roberta Text to SQL model on the example English dataset to view the evaluation performance.
- Redesigned the Rat-SQL model and tested the BERT-multilingual model for the constructed Vietnamese dataset.

Similar Searching Programmer, Big Data & AI Lab in CMC CIST   Jul-Aug 2021
- Constructed an industry tree and generated a Floyd Warshall matrix to evaluate the distance among industries.
- Integrated the companies' features and labeled relations into a knowledge graph to attain triplets.
- Trained the TransE model on triplets to retrieve the graph embedding and utilized the HNSW search algorithm.
- Enhanced the search accuracy by 5% with the ComplEx model and scaNN search algorithm.

Teaching Assistant, Villanova Department of Computing Sciences   2018 - 2019
- Graded students' homeworks, project demonstrated and held office hours for CSC 2053 - Platform Based Computing
- Graded students' homeworks, guest lectured and held office hours for CMC 1052 - Algorithms & Data Struc II

Research Assistant, Dr. Lillian Cassel   May - Aug 2019
- Programmed the front-end interface of the OneUp platform using Bootstrap and CSS, enhancing student engagement through constructed review of quizzes and exams.
- Developed and Integrated 200 conceptual questions and demo exams into the OneUp platform's SQL database, enriching study materials.

AWARDS   **Second Place**, CCSC Eastern Programming Contest   2020

            Second Place in the Wilkes Site, Mid-Atlantic USA Regional Contest   2019

            Second Place in the Wilkes Site, Mid-Atlantic USA Regional Contest   2018

            Third place, Hanoi Physics Olympiad   2015

VALORISATION   **Project-based Research Week**, CORAL   Recent

            Bayesian Methods for Machine Learning, Coursera (verified cert.)   2021

COMPETENCES   **Languages** Vietnamese (*native*), English (*proficient*)

            Programming Tools C++, Python, Java, LaTeX

            Programming Libraries Tensorflow, PyTorch, Ampligraph, scikit-learn, Huggingface- Transformers, Matplotlib, Seaborn

            Programming Techniques Jupyter Notebook, Eclipse, Pycharm, Visual Studio, Google Colab, Code-blocks

PUBLICATIONS   [1] Duong Ta and Tim Oates. *Improving Language Model Reasoning and Reducing Hallucinations Through Metacognitive Prompting **(Imaginary)**.* In Conference on the Advancement of Artificial Intelligence (AAAI), 2024.

            [2] Duong Ta and Tim Oates. *Metacognitive prompting improves the math-solving capability in the Large Language Models **(Imaginary)**.* ACM–2024 10th International Conference on Computing and Artificial Intelligence (ICCAI 2024).

            [3] Duong Ta and Quang Dang. *Interpretable CNN Models for Denoising with Sinewave Signal and Noise **(Imaginary)**.* In 10th International Conference on Signal and Image Processing 2024.