Sungwon Kim

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EDUCATION

Johns Hopkins University ***Baltimore, MD***
Masters in Computer Science *Graduated: May 2025*
- Graduated from Combined Computer Science Masters Program at Johns Hopkins University.

Johns Hopkins University ***Baltimore, MD***
BS Computer Science, Applied Mathematics & Statistics *Graduated: May 2024*
- GPA: 3.90/4.0
- Course Assistant for NLP: Self-supervised Models, Natural Language Processing, Introduction to Algorithms, Automata and Computation Theory, Discrete Math.
- Math Tournament Problem Writer: ASDAN, JHMT (Johns Hopkins Math Tournament).

Work Experience

Johns Hopkins University ***Baltimore, MD***
Research Assistant *August 2025 - Current*
- Research Assistant under Professor Daniel Khashabi

DataTechnica ***Bethesda, MD***
Part Time *August 2024 - December 2024*
- Engineered a medical RAG(Retrieval Augmented Generation) pipeline. Implementing various methods for SQL retrieval including chain-of-thought reasoning and self-consistency.
- Helped create datasets and evaluation metrics for medical questions.

National Institutes of Health ***Bethesda, MD***
Research Intern *May 2024 - August 2024*
- Worked on natural language to SQL query pipeline that scales sublinearly to the number of columns
- Achieved 5% increase in accuracy (80% to 85%) compared to vanilla schema-as-context methods.

Center for Language and Speech Processing ***Baltimore, MD***
Research Assistant *May 2023 – May 2024*
- Created chatbots which cite databases for a web based app.
- Developed and tested various retrieval methods including dense, sparse, hybrid retrieval methods, chunking strategies, LLM fine tuning, for robust search using Huggingface, sbert, Apache Solr, nltk, and more.

Johns Hopkins University ***Baltimore, MD***
Research Assistant *May 2023 – September 2023*
- Created neural network-derived brain perfusion map processing pipeline for model-free CTP images.
- Achieved up to 30% better MSE loss compared to a recent paper on the same dataset.

Republic of Korea Army ***Yanggu, Korea***
Information Systems Maintenance/Operator, Squad Leader. *September 2020 – March 2022*
- Maintained and operated secure military information systems to ensure reliable communication of sensitive data.
- Appointed Squad Leader in June of 2021.

Nexon Korea ***Pangyo, Korea***
Platform Analyst (Intern) *June 2020 – August 2020*
- Analyzed game data logs using SQL, Hadoop, and Python.
- Built ML model (Random Forest, LSTM, XGBoost) to classify player experience levels, improving accuracy by 15%+ over a Markov Chain baseline.

Publications

BiomedSQL: Text-to-SQL for Scientific Reasoning on Biomedical Knowledge Bases
Submitted to ICLR 2025
- Dataset for evaluating scientific reasoning in text-to-SQL generation over a real-world biomedical knowledge base.

Challenging the Evaluator: LLM Sycophancy Under User Rebuttal
Accepted to EMNLP 2025 Findings
- Investigated qualities that trigger LLM sycophancy under user rebuttal.

CARDBiomedBench: A Benchmark for Evaluating Large Language Model Performance in Biomedical Research
Submitted to Lancet Digital Health
- Large Scale Question and Answer Benchmark for evaluating LLMs in biomedical science.

PROJECTS

Embedding-Level Translation for Seamless Communication Across LLM Agents *December 2024*

- Developed an embedding-level translator to enable seamless communication between LLM agents, achieving <0.01 MSE and >0.9 cosine similarity, demonstrating high-fidelity translation across agent representations.

Model Recovery: Reversing Synthetic Influence via Iterative Self-Tuning *December 2024*

- Investigated model recovery techniques to reverse synthetic data-induced collapse in neural networks, demonstrating that conventional methods (e.g., task vector negation, logit interpolation) are ineffective, while magnitude-based pruning and merging yielded promising recovery performance.

Linear Embedding Space Alignment for Semantic Change Detection *June 2024*

- Explored limitations of the Procrustes alignment method for detecting domain shifts in semantic spaces over time.
- Proposed and evaluated alternative linear alignment techniques using unsupervised anchor discovery, tested on a machine translation benchmark.
- Found that while methods varied in approach, no significant performance difference was observed across alignment strategies.

arXiv Reference Finder (Hophacks - 2nd Place Winner) *September 2023*

- Built a tool to extract and highlight relevant sections from referenced papers on arXiv, given a source paper.
- Utilized BM25 and cross-encoders for semantic similarity; integrated arXiv API and applied regex-based PDF chunking and formatting.

Custom Transformers *May 2023 – June 2023*

- Implemented transformer layers with non-standard architectures.
- Achieved lower classification loss than HuggingFace BERT, despite using fewer parameters.

Misc Game Tools(Toys) *June 2020 – June 2022*

- Designed an Excel-based Markov chain model to calculate expected costs of in-game equipment upgrades.
- Developed a course planner to track and store all Johns Hopkins University course data locally.
- Created a Pokémon battle damage calculator and derived a custom method for type ranking analysis.

SKILLS

Programming: Python, Pytorch, HuggingFace Transformers, scikit-learn, pandas, numpy, C++
Software/Skill set: LaTeX, SQL, Microsoft Office (Excel, PowerPoint, Word, Outlook)