Bernal Jiménez Gutiérrez

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RESEARCH INTERESTS

I explore the intersection of **biology** and **AI**, leveraging insights from each to advance the other.

Biology → AI: I am deeply committed to integrating neurobiological principles into AI to address fundamental limitations in current LLM systems. For instance, in our recent work, HippoRAG, we model hippocampal processes to improve long-term memory in large language models (LLMs).

AI → Biology: On the other hand, I am also passionate about harnessing AI to accelerate discovery and optimize workflows in complex and high-impact domains such as biological research and clinical practice.

EDUCATION

The Ohio State University   Ohio, USA
Ph.D. in Computer Science and Engineering   Aug 2019 - July 2025 (Expected)
Advisor: Yu Su

University of California at Berkeley   Berkeley, CA
B.A. in Applied Mathematics (Probability Theory Concentration)   Aug 2011 - December 2015
Minor in Physics

RESEARCH EXPERIENCE

National Library of Medicine   Bethesda, MD
Research Intern; PI: Olivier Bodenreider   May 2022 - August 2022

Mendel AI   San Jose, CA
AI Researcher Developer; Manager: Wael Salloum   June 2016 - June 2019

Redwood Center for Theoretical Neuroscience, UC Berkeley   Berkeley, CA
Research Assistant; PI: Michael DeWeese   July 2014 - March 2016

Language and Cognition Lab, UC Berkeley   Berkeley, CA
Research Assistant; PI: Terry Regier   August 2013 - December 2013

PUBLICATIONS

Google Scholar

1. **From RAG to Memory: Non-Parametric Continual Learning for Large Language Models**
   Bernal Jiménez Gutiérrez*, Yiheng Shu*, Weijian Shi, Sizhe Zhou, Yu Su
   Under Review, February 2025.
2. **Attention in Large Language Models Yields Efficient Zero-Shot Re-Rankers**
   Shijie Chen, Bernal Jiménez Gutiérrez, Yu Su
   ICLR 2025, April 2025.
3. **HippoRAG: Neurobiologically Inspired Long-Term Memory for Large Language Models**
   Bernal Jiménez Gutiérrez, Yiheng Shu, Yu Gu, Michihiro Yasunaga, Yu Su
   NeurIPS 2024, December 2024.
4. **Solving the Right Problem is Key for Translational NLP:**
   A Case Study in UMLS Vocabulary Insertion
   Bernal Jiménez Gutiérrez, Yuqing Mao, Vinh Nguyen, Kin Wah Fung, Yu Su, Olivier Bodenreider
   Findings in EMNLP 2023, December 2023.

5. **Biomedical Language Models are Robust to Sub-optimal Tokenization**
Bernal Jiménez Gutiérrez, Huan Sun, Yu Su
BioNLP Workshop @ ACL 2023, July 2023.

6. **Aligning Instruction Tasks Unlocks Large Language Models as Zero-Shot Relation Extractors**
Kai Zhang, Bernal Jiménez Gutiérrez, and Yu Su
Findings of ACL, July 2023.

7. **Thinking about GPT-3 In-Context Learning for Biomedical IE? Think Again**
Bernal Jiménez Gutiérrez, Nikolas McNeal, Clay Washington, You Chen, Lang Li, Huan Sun, Yu Su
Findings in EMNLP 2022, December 2022.

8. **Clinical Phrase Mining with Language Models**
Kaushik Mani, Xiang Yue, Bernal Jiménez Gutiérrez, Yungui Huang, Simon M. Lin, Huan Sun
2020 IEEE International Conference on Bioinformatics and Biomedicine (BIBM), December 2020.

9. **Document Classification for COVID-19 Literature**
Bernal Jiménez Gutiérrez, Juncheng Zeng, Dongdong Zhang, Ping Zhang, Yu Su
Findings in EMNLP 2020, November 2020.

10. **Clinical Reading Comprehension: A Thorough Analysis of the emrQA Dataset**
Xiang Yue, Bernal Jiménez Gutiérrez, Huan Sun
ACL 2020, July 2020.

11. **Improving Clinical Trial Participant Pre-Screening with Artificial Intelligence (AI): a Comparison of the Results of AI-Assisted vs. Standard Methods in Three Oncology Trials**
Denise Calaprice-Whitty, Karim Galil, Wael Salloum, Ashkon Zariv, Bernal Jiménez Gutiérrez
TIRS (Therapeutic Innovation and Regulatory Science), January 2020.

GRANTS

NIH R01: Machine Learning Drives Translational Drug Interaction and Pharmacogenetics Research
Role: Personnel (Contributed to framing & writing).
Grant: $3,118,680. 2023-2027.
Impact Score from Review Panel: 10, top 1%

OSU TDAI Research Pilot Grant: Practical and Comprehensive Social Media Pharmacovigilance
Role: Personnel (Contributed to framing & writing).
Grant: $50,000. 2021-2022.

SERVICES

PC Member/ External Reviewer:
EACL 2021
KDD 2021, 2022
EMNLP 2020, 2021, 2022
ACL 2021, 2023
AAAI 2024
ARR 2024

Area Chair:
ARR June 2024