



Sagi Shaier

 Google Scholar

 Sagi.Shaier@colorado.edu

 GitHub

 Personal Website

 LinkedIn

 Towards Data Science Blog

Research Interests

Artificial general intelligence, knowledge-enhanced question answering systems, continual learning, factuality

Education

University of Colorado Boulder

Boulder, Colorado

PhD IN COMPUTER SCIENCE

Aug. 2020 - Aug. 2025 (estimate)

Co-advised by [Katharina Kann](#) and [Lawrence Hunter](#)

Kennesaw State University

Kennesaw, Georgia

BACHELOR'S OF SCIENCE

Aug. 2014 - Dec. 2018

Major in Computational and Applied Mathematics, Statistics minor, Pre-Med track. 3.96 GPA

Publications (Accepted)

- 2024 **Shaier**, Hunter, von der Wense, “It Is Not About What You Say, It Is About How You Say It: A Surprisingly Simple Approach for Improving Reading Comprehension”. The 62nd Annual Meeting of the Association for Computational Linguistics (**ACL Findings**).
- 2024 **Shaier**, Hunter, von der Wense, “Desiderata For The Context Use Of Question Answering Systems”. The 18th Conference of the European Chapter of the Association for Computational Linguistics (**EACL**).
- 2024 **Shaier**, Bennett, Hunter, von der Wense, “Comparing Template-based and Template-free Language Model Probing”. The 18th Conference of the European Chapter of the Association for Computational Linguistics (**EACL**).
- 2023 **Shaier**, Hunter, Kann, “Who Are All The Stochastic Parrots Imitating? They Should Tell Us!”. The 13th International Joint Conference on Natural Language Processing and the 3rd Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics (**IJCNLP-AAACL**).
- 2023 **Shaier**, Bennett, Hunter, Kann, “Emerging Challenges in Personalized Medicine: Assessing Demographic Effects on Biomedical Question Answering Systems”. The 13th International Joint Conference on Natural Language Processing and the 3rd Conference of the Asia-Pacific Chapter of the Association for Computational Linguistics (**IJCNLP-AAACL**). **Won Social Impact Award**.
- 2022 **Shaier**, Hunter, Kann, “Mind the Knowledge Gap: A Survey of Knowledge-enhanced Dialogue Systems” (**arXiv** submission)
- 2022 **Shaier**, S., Raissi, M. and Seshaiyer, P., “Data-Driven Approaches for Predicting Spread of Infectious Diseases Through DINNs: Disease Informed Neural Networks”. **Letters in Biomathematics**, Vol. 8, Iss. 1, pp. 71-105. Impact factor: 2.78.
- 2019 **Shaier**, S, Burke, M. "A Mathematical Model for the Effect of Domestic Animals on Human African Trypanosomiasis (Sleeping Sickness)". **The Kennesaw Journal of Undergraduate Research**: Vol. 6 : Iss. 1, Article 1.

Publications (Under Review)

- 2024 **Shaier**, Kobren, Ogren, “Adaptive Question Answering: Enhancing Language Model Proficiency for Addressing Knowledge Conflicts with Source Citations”.
- 2024 **Shaier**, Sridhar, Baker, Hunter, von der Wense, “ENIGMA: A Comprehensive Cloze-style Knowledge probing Benchmark”.
- 2024 **Shaier**, Baker, Sridhar, Hunter, von der Wense, “MALAMUTE: A Multilingual, Highly-granular, Template-free, Education-based Probing Dataset”.
- 2024 **Shaier**, Hunter, von der Wense, “Citations-informed Language Models”.

Professional Experience

Oracle

Research Intern

Jan. 2024 - April, 2024

- Bridged the gap between ambiguous QA and citation generation by proposing the novel task of QA with source citation in ambiguous settings, where multiple valid answers exist
- Provided a comprehensive framework featuring: five novel datasets with citation metadata, the first ambiguous multi-hop QA dataset, two new evaluation metrics, and strong baselines

The National Institutes of Health

Machine Learning Research Special Volunteer

May. 2023 - Present

- Developing biologically-inspired continual learning algorithms

University of Colorado Boulder

Graduate Research Assistant

Jan. 2022 - Present

- Validating and improving our internal biomedical knowledge graph and knowledge graph creation methods

Graduate Teaching Assistant

Aug. 2020 - Jan. 2022

- Algorithms: graded proof-based assignments and taught weekly hour-long recitations on the fundamentals of algorithms and various algorithmic strategies
- Human Computer Interaction: directed weekly hour-long recitations on techniques for user-centered design and the development of interactive technologies

Pacific Northwest National Laboratory

National Security PhD Intern

May. 2021 - Oct. 2021

- Applied topological structures to high dimensional word embeddings
- Used topological data analysis methods to identify logic in NLP
- Experimented with novel word representation approaches

Quantum Metric

Data Scientist - Research Team

Dec. 2019 - May. 2020

- Spearheaded strategic projects such as predictive behavioral analytics, predictive churn risk score, loyalty score, & more
- Researched, constructed, and implemented various algorithms to predict customers' psychological nature across diverse industries such as airlines, retail, & banking
- Integrated Google's BigQuery, AutoML, & servers to optimize queries and analyses on big data while utilizing numerous supervised & unsupervised algorithms such as XGBoost, K-Means, Regressions, DBSCAN, PCA, Random Forest, & Neural Networks

Kepler Computing

Machine Learning Research Engineer (Contract)

July. 2019 - Oct. 2019

- Identified key computation characteristics of AI workloads in areas such as self-driving, vision, speech, and AR/VR
- Worked with the chief computer architect and HPC engineers to co-design groundbreaking AI ASIC
- Studied cutting edge AI workloads and tracked innovations happening in AI

Welocalize

Machine Learning Intern

May. 2019 - Aug. 2019

- Built regression models to predict project duration times and to detect outliers
- Gathered, engineered, and visualized various data types
- Identified bottlenecks within the organization using clustering analysis, Seaborn correlations, dimensionality reduction, and H2O.AI RF

Hack Oregon

Data Scientist on the Disaster team (Volunteer)

Feb. 2019 - Oct. 2019

- **Mapped** the distribution of likely casualties in the 9.0 Cascadia Earthquake in order to better understand medical response needs

Awards

Spring 2024 **Outstanding Service Fellowship** University of Colorado Boulder

Spring 2024 **Outstanding Research Papers Fellowship** University of Colorado Boulder

Spring 2024 **Conference Support Fellowship** University of Colorado Boulder

Spring 2024 **Publication Recognition Award (Desiderata For The Context Use Of Question Answering Systems)** University of Colorado Boulder

Spring 2024 **Publication Recognition Award (Comparing Template-based and Template-free Language Model Probing)** University of Colorado Boulder

Fall 2023 **IJCNLP-AAACL 2023 Social Impact Award** AAACL

Fall 2023 **Publication Recognition Award (Who Are All The Stochastic Parrots Imitating? They Should Tell Us!)** University of Colorado Boulder

Fall 2023 **Publication Recognition Award (Emerging Challenges in Personalized Medicine: Assessing Demographic Effects on Biomedical Question Answering Systems)** University of Colorado Boulder

Fall 2023 **Endowed Founder's Fellowship** University of Colorado Boulder

Fall 2023 **Nelson Prager and James H Martin Endowed Graduate Fellowship** University of Colorado Boulder

Fall 2023 **Conference Support Fellowship** University of Colorado Boulder

Summer 2021 **Dean's Summer Research Fellowship** University of Colorado Boulder

Fall 2020 **Early Career Professional Development Fellowships** University of Colorado Boulder

Fall 2020 **Departmental Fellowship** University of Colorado Boulder

Fall 2018 **National Science Foundation Scholarship** Kennesaw State University

Summer 2018 **Society for Mathematical Biology Award** Kennesaw State University

Summer 2018 **Birla Carbon Scholarship** Kennesaw State University

Spring 2018 **National Science Foundation Scholarship** Kennesaw State University

Spring 2018 **Undergraduate Research Award** Kennesaw State University

Fall 2017 **National Science Foundation Scholarship** Kennesaw State University

Talks + Posters

Mar. 2024	Desiderata For The Context Use Of Question Answering Systems	The 18th Conference of the European Chapter of the Association for Computational Linguistics (EACL) in Malta
Mar. 2024	Comparing Template-based and Template-free Language Model Probing	The 18th Conference of the European Chapter of the Association for Computational Linguistics (EACL) in Malta
Nov. 2023	Emerging Challenges in Personalized Medicine: Assessing Demographic Effects on Biomedical Question Answering Systems	Asia-Pacific Chapter of the Association for Computational Linguistics (IJCNLP-AAACL) in Bali, Indonesia
Nov. 2023	Who Are All The Stochastic Parrots Imitating? They Should Tell Us!	Asia-Pacific Chapter of the Association for Computational Linguistics (IJCNLP-AAACL) in Bali, Indonesia
Jan. 2023	Extreme Multi-hop Question Answering on a Massive Biomedical Knowledge Graph	Pacific Symposium on Biocomputing in The island of Hawaii, Hawaii
Dec. 2022	On Language Models, Medicine, and Factuality	International Society for Computational Biology in Aspen, Colorado
Jul. 2018	A Mathematical Model for the Effect of Domestic Animals on the Basic Reproduction Number of Human African Trypanosomiasis (Sleeping Sickness)	Annual Meeting of the Society for Mathematical Biology in Sydney, Australia
Apr. 2018	A Mathematical Model for the Effect of Domestic Animals on the Basic Reproduction Number of Human African Trypanosomiasis (Sleeping Sickness)	KSU Symposium of Student Scholars in Kennesaw, Georgia
Jul. 2017	A Mathematical Model for the Effect of Domestic Animals on Human African Trypanosomiasis (Sleeping Sickness)	Annual Meeting of the Society for Mathematical Biology in Utah
Apr. 2017	A Mathematical Model for the Effect of Domestic Animals on Human African Trypanosomiasis (Sleeping Sickness)	KSU Symposium of Student Scholars in Kennesaw, Georgia
Mar. 2017	A Mathematical Model for the Effect of Domestic Animals on Human African Trypanosomiasis (Sleeping Sickness)	Southern Regional Honors Conference in Asheville, North Carolina

Mentoring Master Students

Spring 2024	Developing a method to automatically evaluate dialogue systems	Chiranthan Sridhar
Spring 2024	Developing a method to automatically evaluate dialogue systems	Mario Choy
Spring 2024	Multihop question answering for language models with extreme context size	Ankush Raut
Spring 2024	Multihop question answering for language models with extreme context size	George Baker
Fall 2023	Proposing a new task and baselines on evaluating when text requires a citation	Arvind Sreenivas
Fall 2023	Multihop question answering for language models with extreme context size	George Baker
Fall 2023	Multihop question answering for language models with extreme context size	Ankush Raut
Fall 2023	Developing a method to automatically evaluate dialogue systems	Mario Choy
Fall 2023	Developing a method to automatically evaluate dialogue systems	Chiranthan Sridhar
Spring 2022	Evaluating when knowledge graphs are better than free-form text	Satviki Sanjay Pathak
Spring 2023	Using language models to generate text with citations to evaluate its factuality	Chiranthan Sridhar
Spring 2023	Evaluating evaluation methods that measure the factuality of text	Arvind Sreenivas
Spring 2023	Developing approaches that use existing medical textbooks to improve the performance on the United States Medical License Exams dataset (MedQA-USMLE)	George Baker
Fall 2022	Developing a method to automatically evaluate dialogue systems	Satviki Sanjay Pathak

Military

Israel Defense Forces

Israel
Aug 2010 - Aug. 2013

- Prevented further escalations in terrorism throughout the Middle East