Hannah Gonzalez

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Philadelphia, Pennsylvania

RESEARCH INTERESTS

I am excited about **harnessing foundation models for social good**. In particular, I am drawn to the following research directions: 1) Quality in Education. 2) Evaluating LLMs.

EDUCATION

University of Pennsylvania   *Philadelphia, PA*
M.S.E. Computer and Information Science.   December 2023
B.S.E. Computer and Information Science. Magna Cum Laude.   May 2023
Minors: Mathematics; Engineering Entrepreneurship.

RESEARCH EXPERIENCE

University of Pennsylvania   *Philadelphia, PA*
Research Assistant, *with Eleni Miltsakaki and Chris Callison-Burch*   August 2021-Present

- Conducted a feasibility study into the applicability of question generation models to textbook passages. Served as an annotator and refined annotation guidelines. Published paper at *ACL 2022* [4].

- Spearheaded research to enhance human summaries for question-answer generation in education through the use of LLMs. Published first-author paper in *BEA at ACL 2023* [1]. Delivered poster presentations and talks in additional venues (Stanford, Penn, CRA, Google Research).

- Led a team of five to investigate the impact of augmenting educational videos with automatically generated summaries. Co-organized user studies with 100+ participants. Published first-author paper in *BEA at ACL 2023* [2].

- Developed an Alexa Show application that quizzes students with relevant automatically generated questions from multiple courses.

University of Pennsylvania   *Philadelphia, PA*
Research Assistant, *with Eleni Miltsakaki and Kostas Daniilidis*   May 2023-Present

- Investigating the applicability of LLMs on vision-and-language navigation in robotics.

Center For Neuroengineering and Therapeutics   *Philadelphia, PA*
Research Assistant, *with Kathryn Davis*   August 2021-May 2022

- Trained a deep learning model (U-Net) on a cloud GPU to segment surgically removed tissue from MRI scans of the brain. Published paper in *NeuroImage: Clinical* [5]. Delivered two poster presentations.

PUBLICATIONS

[1] Enhancing Human Summaries for Question-Answer Generation in Education. **Hannah Gonzalez**, Liam Dugan, Eleni Miltsakaki, Zhiqi Cui, Jiaxuan Ren, Bryan Li, Shriyash Upadhyay, Etan Ginsberg, Chris Callison-Burch. In *Proceedings of the 18th Workshop on Innovative Use of NLP for Building Educational Applications: BEA at ACL 2023*, pages 108-118, Toronto, Canada, July 2023.

[2] Automatically Generated Summaries of Video Lectures May Enhance Students' Learning Experience. **Hannah Gonzalez**, Jiening Li, Helen Jin, Jiaxuan Ren, Hongyu Zhang, Ayotomiwa Akinyele, Adrian Wang, Eleni Miltsakaki, Ryan Baker, Chris Callison-Burch. In *Proceedings of the 18th Workshop on Innovative Use of NLP for Building Educational Applications: BEA at ACL 2023*, pages 382-393, Toronto, Canada, July 2023.

[3] Question Generation for textbook Flashcards. Liam Dugan, Eleni Miltsakaki, Shriyash Upadhyay, Etan Ginsberg, **Hannah Gonzalez**, Dayheon Choi, Chuning Yuan, Chris Callison-Burch. In *EDULEARN22 Proceedings*, pages 3412-3412, Palma, Spain, July 2022.

[4] A Feasibility Study of Answer-Agnostic Question Generation for Education. Liam Dugan, Eleni Miltsakaki, Shriyash Upadhyay, Etan Ginsberg, **Hannah Gonzalez**, Dayheon Choi, Chuning Yuan, Chris Callison-Burch. In *Findings of the Association for Computational Linguistics: ACL 2022*, pages 1919–1926, Dublin, Ireland, May 2022.

[5] Deep learning-based automated segmentation of resection cavities on postsurgical epilepsy MRI. Arnold Campbell, Ramya Muthukrishnan, Akash Pattnaik, Nishant Sinha, Adam Gibson, **Hannah Gonzalez**, Sandhitsu R. Das, Brian Litt, Dario J. Englot, Victoria L. Morgan, Kathryn A. Davis MD, Joel M.Stein. *NeuroImage: Clinical 36*, page 103154, January 2022.

GRANTS AND AWARDS

Walter Korn Award   University of Pennsylvania, 2023
Awarded annually to one outstanding senior in the Moore School of Engineering at the University of Pennsylvania who will pursue a graduate degree in the Moore School. Selection of the recipient is made by the Moore School chairs and faculty, in conjunction with the Associate Dean for Undergraduate Education.

Best Poster in Computer Science Award   Stanford University, 2023
Awarded for an outstanding presentation at Stanford Research Conference.

Dean's List   University of Pennsylvania, 2022
Awarded annually to any student who achieves a combined GPA of 3.7 for the fall and spring semesters.

Vagelos Undergraduate Research Grant   University of Pennsylvania, 2022
Grant that supports outstanding undergraduate research efforts.

Gutmann-Doyle Research Opportunities Fund Award   University of Pennsylvania, 2022
Award to assist with activities associated with independent research projects.

CS Research Mentorship Program (CSRMP) Scholar   Google Research, 2021
CSRMP matches students from historically marginalized groups with peers and a Google mentor to support their pursuit of computing research pathways.

Women of Color in Technology Scholarship Recipient   Anita B.org, 2021
Full scholarship to attend Grace Hopper Celebration.

INVITED TALKS

Stanford Research Conference (Poster Presenter)	Stanford University, 2023
Spring Research Symposium (Poster Presenter)	University of Pennsylvania, 2023
Grad Cohort for IDEALS Research Lightning Talk (Presenter)	Computer Research Association, 2023
CSRMP Alumni Panel Research Presentation (Presenter)	Google Research, 2023
OurCS (Poster Presenter)	Carnegie Mellon University, 2022
CSRMP Alumni Panel Research Presentation (Presenter)	Google Research, 2022
Spring Research Symposium (Poster Presenter)	University of Pennsylvania, 2022
Penn Neuroscience Society Expo (Poster Presenter)	University of Pennsylvania, 2022
Finding the Right Fit Career Orientation (Panelist)	Education USA, 2022
Women In Computer Science Big Tech Internship Panel (Panelist)	University of Pennsylvania, 2021

PROFESSIONAL EXPERIENCE

Microsoft AI, Core Search and AI Team *Redmond, WA*
Software Engineer (Level 60) *January 2024*

- Incorporated RAG scenarios in Enterprise search.

- Worked on production code for model hosting, deployment, and testing of Azure Semantic Search's multilingual 2048 ranker. Programmed in .NET and C#.

  - Ranker showed consistent relevance gains across datasets, improving the NDCG@3 by an average of 6.7% for the testing datasets.

  - Ranker simplified the information retrieval L2 stack by extracting relevant information and providing scores for highlights, Q&A, and snippets—all within a single model.

  - Ranker increased the number of input tokens to 2048 (previously 256 tokens).

- Owned feature that truncates answers and captions based on user's input for maximum length in Azure Semantic Search.

Microsoft Corporation, Core Search and AI Team *Redmond, WA*
Software Engineer Intern *May 2023-August 2023*

- Developed a full-stack application that empowers data scientists to efficiently visualize and compare their experiments.

- Created a user interface in React to view all available experiments. Implemented a report builder engine.

- Generated insights with LLMs for scorecard analysis.

Microsoft Corporation, Core Search and AI Team *Bellevue, WA*
Software Engineer Intern *May 2022-August 2022*

- Introduced Vector Search to Azure Cognitive Search. Vector Search uses machine learning techniques to analyze search queries and provides faster and more accurate results.

- Implemented, optimized, and tested a Vectorization Pipeline in Azure Machine Learning (AML). Programmed in Python and used tools such as Azureml, Asyncio, and Mockito.

- The pipeline comprised the following components: reading and parsing documents and queries from Blob storage in an asynchronous manner, utilizing Bing's cutting-edge model to obtain vector representations for both queries and documents, and transferring the vectors to an Approximate Nearest Neighbors graph.

- The vectorization pipeline enhanced the team's efficiency in conducting experiments within AML and established a standardized procedure.

Microsoft Corporation, Research and Development Engineering Team *Redmond, WA*
Software Engineer + Product Manager Intern *May 2021-August 2021*

- Designed, implemented, and tested a report on Endpoint Analytics called Shadow IT.

- Created the data pipeline for the report using Scala, Apache Spark, and Databricks.

- Ensured the software's security and compliance through a Full Life Cycle Review, Specification Review, Security Reviews, Privacy Reviews, Graph API Review, and demos of the report.

- Performed customer interviews, competitor analysis, and iterated on our design and functional requirements.

TEACHING AND MENTORING EXPERIENCE

University of Pennsylvania *Philadelphia, PA*
Teaching Assistant for Artificial Intelligence (CIS 5210) with Chris Callison-Burch *August 2023-Present*

- Responsibilities include holding weekly office hours, leading recitations, and formulating examination questions for a course taken by over 400 students per semester.

University of Pennsylvania *Philadelphia, PA*
Course Staff for Engineering Entrepreneurship I (EAS 5450) August 2022-May 2023

- Graded weekly assignments for Professor Babin's Entrepreneurship course.

University of Pennsylvania *Philadelphia, PA*
Course Staff for Project Management (ESE 544) August 2021-May 2022

- Graded weekly assignments for Dr. Wilkof's Engineering Project Management course.

University of Pennsylvania *Philadelphia, PA*
Instructor at Penn's Fife Academy August 2020-December 2020

- Lead instructor of programming course taught in Python to a group of 5 high school students.

University of Pennsylvania *Philadelphia, PA*
Teaching Assistant at Penn Engineering Summer Academy July 2020

- Collaborated with four co-instructors to teach a Python programming course with a focus on Data Science to a diverse group of over 30 students from across the globe.
- Organized online social activities along with co-instructors. Held weekly office hours.

Redefine *Remote*
Mentor July 2020

- Mentored underrepresented high school students to encourage their pursuit of a career in Computer Science.
- Conducted weekly office hours to aid students with their homework.

SKILLS

Languages: English (fluent), Spanish (native speaker), French (conversational)

Technical Skills: Python, Java, HTML, CSS, Figma, Git, SQL, LaTeX

LEADERSHIP AND ACTIVITIES

University of Pennsylvania *Philadelphia, PA*
Board Member for Advancing Women in Engineering; Leader of Professional Committee 2021-2023

- Enhanced the academic experience of female students in Penn Engineering by expanding research and professional opportunities.
- Organized social and networking opportunities for women in engineering.
- Developed and supported initiatives to increase the number of women interested in studying engineering at Penn.

Carnegie Mellon University *Pittsburgh, PA*
OurCS Student Researcher. *Advised by Hoda Heidari.* October 2022

- Received 1/38 scholarships to attend CMU's 3-day research workshop for undergraduate women students.
- Worked collaboratively on an Artificial Intelligence Bias Regulation Aggregator. Presented a poster.

Google *Remote*
Latinx Student Leader April 2022

- Selected as one of 130 Latinx student leaders from a pool of 800+ applicants to attend Google's Latinx Student Leadership Summit 2022.
- Collaborated with Google's Latinx leadership to support the Latinx community at my university.

Soulsmile Club *Remote*
Head of Outreach and Founding Team Member June 2020-August 2021

- Formed partnerships with non-profit organizations and retailers.

- Assigned tasks to team members, planned our next steps, wrote monthly minutes using Jira and Confluence.

- Co-managed Soulsmile's Instagram and Facebook accounts. Wrote blog posts about Soulsmile's Chrome extension. Increased engagement in social media by over 15%.

Harvard University *Remote*
Harvard 2021 WECode Tech Fellow December 2020-April 2021

- Advocated diversity and inclusion in STEM. Promoted Harvard's WECode Conference. Performed international outreach.

NASA *Remote*
Computer Engineer at L'SPACE Mission Concept Academy August 2020-January 2021

- 12-week Academy designed to provide unique, hands-on learning, and insight into the dynamic world of the space industry.

- Learned about NASA's mission procedures and protocols from industry professionals.

- Collaborated with fellow team members to complete mission-related team-project (Lander on Enceladus).

Meta *Remote*
Above and Beyond Computer Science (ABCS) Selected Participant September 2020-December 2020

- Engaged in 10-week data structures, algorithmic thinking, and best practices for technical interview series led by Facebook software engineers.

University of Pennsylvania *Philadelphia, PA*
Website and Media Manager for Women in Computer Science August 2019-May 2020

- Created and managed the club's Instagram account. Updated Women in Computer Science (WiCS) club's website. Planned events that promote interest in Computer Science. Designed posters for the club's events.

University of Pennsylvania *Philadelphia, PA*
Aircraft Engineer at Penn Aerospace August 2019-May 2020

- Sized and structured aircraft for Penn Aerospace's first SAE Design Aero competition along with teammates.

- Performed 3D printing, laser cutting, and monokoting.

Massachusetts Institute of Technology *Remote*
Student at Beautiful Patterns Summer Program July 2018

- Acquired knowledge of pattern design, honed logical thinking skills, and participated in a collaborative, advanced learning environment centered around information technologies.

Stanford University *Palo Alto, CA*
Student at Pre-Collegiate Summer Institutes Course in Engineering July 2017

- Designed and built a cell phone-based microscope. Exposed to a variety of fields including microbiology, optics, computer-aided drafting, and prototyping.

SERVICE

University of Pennsylvania *Philadelphia, PA*
Master's Representative at CIS Faculty meetings September 2023-Present

University of Pennsylvania *Philadelphia, PA*
Penn Alumni Interviewer September 2023-Present