Benyamin T. Tabarsi

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RESEARCH INTERESTS

My research focuses on Generative AI and Computing Education, with an emphasis on developing intelligent systems that enhance learning experiences and support educators. A central aspect of my work is ensuring robustness, reliability, and adaptability in AI-driven tools to build trust and improve accuracy. My long-term goal is to leverage AI for social impact by developing scalable, human-centered technologies that address real-world needs and make educational resources more accessible and effective.

EDUCATION

North Carolina State University **Expected May 2026**
Ph.D. in Computer Science *Raleigh, NC*
- Advisor: Dr. Tiffany Barnes, Co-Advisor: Dr. Dongkuan (DK) Xu

Science and Research Branch of Azad University **Aug 2019**
Master of Computer Software Engineering *Tehran, Iran*

University of Mazanadran **Aug 2016**
Bachelor of Information Technology Engineering *Babolsar, Iran*

RESEARCH EXPERIENCE

Graduate Research Assistant, *North Carolina State University* **May 2022 – Present**
- Analyzing coding patterns of novice programmers to boost their learning experience and develop intelligent support tools
- Conducting multiple studies on Large Language Models (LLMs), including developers' usage of LLMs, co-development of a RAG-based healthcare app, and training educators on integrating ChatGPT into class

Research Assistant, *Distributed Systems Laboratory, Azad University, Iran* **Nov 2017 – Aug 2019**
- Guided students in conducting their research and led group discussions on topics concerning distributed systems, IoT, and e-healthcare

SKILLS

Languages: Python, Java, C++, R, HTML, CSS, PHP, MATLAB
Databases and Operating Systems: MySQL, Linux, MongoDB
Tools/Libraries: GIT, LlamaIndex, LangChain, Keras, PyTorch, Matplotlib, Jupyter, NLTK, Docker, Scikit-learn

PUBLICATIONS

1. **Developing LLM-Powered Trustworthy Agents for Personalized Learning Support**
   - **Benyamin Tabarsi**
   - In Proceedings of the 39th Association for the Advancement of Artificial Intelligence (AAAI), 2025
2. **MerryQuery: A Trustworthy LLM-Powered Tool Providing Personalized Support**
   - **Benyamin Tabarsi**, Aditya Basarkar, Xukun Liu, Dongkuan (DK) Xu, Tiffany Barnes
   - In Proceedings of the 39th Association for the Advancement of Artificial Intelligence (AAAI), 2025
3. **Empowering Secondary School Teachers: Creating, Executing, and Evaluating a Transformative**

Professional Development Course on ChatGPT
- Heidi Reichert, **Benyamin Tabarsi**, Zifan Zang, Cheri Fennell, Indira Bhandari, David Robinson, Madeline Drayton, Catherine Crofton, Matthew Lococo, Dongkuan (DK) Xu, Tiffany Barnes
- In Proceedings of the 2024 IEEE Frontiers in Education (FIE 24), 2024

4. **Jigsaw: A Visual Tool for Decomposing and Planning Programming Problems**
   - Heidi Reichert, **Benyamin Tabarsi**, Thomas Price, Tiffany Barnes
   - In Proceedings of the 2024 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC), 2024
   - ***Best Research Paper Award***
5. **Scaffolding Novices: Analyzing When and How Parsons Problems Impact Novice Programming in an Integrated Science Assignment**
   - **Benyamin Tabarsi,** Heidi Reichert, Nicholas Lytle, Veronica Catete, Tiffany Barnes
   - In Proceedings of the 2024 ACM Conference on International Computing Education Research (ICER)-Volume 1, 2024
6. **Experience Helps, but It Isn't Everything: Exploring Causes of Affective State in Novice Programmers**
   - Heidi Reichert, Sandeep Sthapit, **Benyamin T. Tabarsi**, and Ally Limke, Thomas Price, Tiffany Barnes
   - In Proceedings of the 55th ACM Technical Symposium on Computer Science Education (SIGCSE) V. 2, 2024
7. **Investigating the Impact of On-Demand Code Examples on Novices' Open-Ended Programming Experience**
   - Wengran Wang, John Bacher, Amy Isvik, Ally Limke, Sandeep Sthapit, Yang Shi, **Benyamin T. Tabarsi**, Keith Tran, Veronica Cateté, Tiffany Barnes, Chris Martens, Thomas Price
   - In Proceedings of the 2023 ACM Conference on International Computing Education Research (ICER)-Volume 1, 2023
8. **Exploring Novices' Struggle and Progress During Programming Through Data-Driven Detectors and Think-Aloud Protocols**
   - **Benyamin Tabarsi**, Heidi Reichert, Rachel Qualls, Thomas Price, Tiffany Barnes
   - In 2023 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC), 2023
9. **Pinpoint: A record, replay, and extract system to support code comprehension and reuse**
   - Wengran Wang, Gordon Fraser, Mahesh Bobbadi, **Benyamin T. Tabarsi**, Tiffany Barnes, Chris Martens, Shuyin Jiao, Thomas Price
   - In 2022 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC), 2022
10. **How to Catch Novice Programmers' Struggles: Detecting Moments of Struggle in Open-Ended Block-Based Programming Projects using Trace Log Data**
    - **Benyamin T. Tabarsi**, Ally Limke, Heidi Reichert, Rachel Qualls, Thomas Price, Chris Martens, Tiffany Barnes
    - In Proceedings of the 6th Educational Data Mining in Computer Science Education (CSEDM) Workshop, 2022
11. **How, when, and why do novices struggle in programming? Exploring the experiences and perceptions of common programming moments in block-based environments**
    - Heidi Reichert, Ally Limke, **Benyamin T. Tabarsi**, Thomas Price, Chris Martens, Tiffany Barnes
    - In Proceedings of the 6th Educational Data Mining in Computer Science Education (CSEDM) Workshop, 2022
12. **ROGI: Partial Computation Offloading and Resource Allocation in the Fog-Based IoT Network Towards Optimizing Latency and Power Consumption**

- **Benyamin T. Tabarsi**, Ali Rezaee, Ali Movaghar
- In the Journal "Cluster Computing," 2022

HONORS AND AWARDS

Best Research Paper Award in IEEE VL/HCC 2024
- For "Jigsaw: A Visual Tool for Decomposing and Planning Programming Problems"

Ranked #1 in Cumulative GPA among the 2016 Cohort of the Master's Program in Computer Software Engineering

TEACHING EXPERIENCE

Instructor, *North Carolina State University, Raleigh, NC* **May – Aug 2023**
- Administered the course "Introduction to Computing Environments (E115)" by coordinating curriculum implementation, student support, and supervising teaching assistants

Graduate Teaching Assistant, *North Carolina State University, Raleigh, NC* **Aug 2021 – May 2022**
- Assisted in designing coding/written questions, grading, and office hours for "Automated Learning and Data Analysis"
- Graded assignments/exams and provided academic support during office hours for "Data Structures and Algorithms"

MENTORING EXPERIENCE

Mentor for Master's Students
1. Teddy Chen (*North Carolina State University, NC,* Fall 2024)
2. Homak Patel (*North Carolina State University, NC,* Fall 2024)

Mentor for Undergraduate Research Interns, *North Carolina State University*
1. Ary Kumar (*North Carolina State University, NC,* Fall 2024, Spring 2025)
2. Aishwarya Radhakrishnan (*North Carolina State University, NC,* Summer 2024, and Fall 2024)
3. Michelle Jiang (*UNC Chapel Hill, NC,* Summer 2024)
4. Jonathan Hardwick (*Fayetteville Technical Community College, NC,* Summer 2024)
5. Susanna Quayle (*Fayetteville Technical Community College, NC*, Summer 2024)
6. Praneel Magapu (*North Carolina State University, NC,* Summer 2024)
7. Aditya Basarkar (*North Carolina State University, NC,* Summer 2024)
8. Lavan Aditya (*North Carolina State University, NC*, Spring 2024 and Summer 2024)
9. Shiva Gadireddy (*North Carolina State University, NC,* Summer 2023, Fall 2023, and Spring 2024)
10. Samantha Gonzalez (*Kean University, NJ,* Summer 2023)
11. Yadhira Marcos-Avila (*UNC Charlotte, NC,* Summer 2023)
12. Rachel Qualls (*University of Alabama, AL,* Summer 2022)
13. Sana Mahmoud (*North Carolina State University, NC,* Summer 2022)
14. Maggie Lin (*North Carolina State University, NC,* Summer 2022)

Mentor for Teacher Research Interns, *North Carolina State University, Raleigh, NC*
1. Cherri Fennel (*Durham Public Schools, NC,* Summer 2023)
2. Matthew Lococo (*Greene County School, NC,* Summer 2023)

CURRENT RESEARCH PROJECTS

MerryQuery: An LLM-Powered Tool for Personalized Educational Support **May 2024 - Present**
- Conducting research and leading the development of an LLM-powered assistant that delivers personalized support for educators and students through adaptive, rule-based, and reliable AI-driven guidance.

ChatLearn: Creating Benchmark Dataset for Sexual Health Conversations **August 2024 - Present**

- Developing a benchmark dataset of LLM-generated conversations for parental training in sexual health communication, along with an evaluation protocol to assist researchers in assessing AI performance in sensitive health communication contexts.

A Comprehensive Exploration of LLMs Impacts on Software Development **May 2024 - Present**

- Co-led a study using semi-structured interviews with 16 professional developers, analyzing how LLMs impact coding tasks, support learning, and development processes.

PROFESSIONAL SERVICE AND MEMBERSHIPS

Reviewer

- ACM The International Conference on Learning Analytics & Knowledge (LAK) **2025**
- IEEE Global Engineering Education Conference (EDUCON) **2025**
- ACM Technical Symposium on Computer Science Education (SIGCSE) **2023 - 2025**
- IEEE Frontiers in Education (FIE) **2024**

Invited Talks and Panels

- "MerryQuery: An AI-Powered Tool for Personalized Learning Support"
  - Presented to the students of the course "Intro to Educational Innovation & Entrepreneurship (ECI 519-601)" at NC State University in Fall 2024
- NC State Doctoral Recruiting Day - Graduate Student Q&A Roundtable
  - Shared insights on PhD experience, balancing research and coursework, and strategies for success in graduate school in Spring 2024
- "From the Internet of Things to Fog Computing"
  - Delivered to the students of the course "Distributed Systems" at Azad University in 2018

IEEE Student Member **2018 & 2023 – Present**

ACM Student Member **2023 – Present**

Workshop Instructor and Mentor, *North Carolina State University* **June 2023 – June 2024**

- Mentored the development and co-led instruction of workshop series for K-12 teachers on integrating ChatGPT into a classroom across three iterations

Summer Camp Teacher and Curriculum Consultant, *North Carolina State University* **July 2022**

- Led a group of 20+ high school students in a one-week block-based programming camp, focusing on games and art in Snap*!*