Mehmet Arif Demirtas

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Summary

I'm **Arif** (he/him)! In my research, I develop and evaluate systems to support instructors and students using generative AI models through human-centered design.

Education

University of Illinois Urbana-Champaign *Aug 2023 – (Exp.) May 2028*
Ph.D., Computer Science

- **Thesis Advisor:** Dr. Katie Cunningham
- **Research Interests:** Computer Science Education, Human-Computer Interaction

Istanbul Technical University *Sep 2018 - Jan 2023*
BSc., Computer Engineering

- **Thesis Project:** *Automated Realistic Lip Sync Generation for Unconstrained Videos*, advised by Dr. Hazim Kemal Ekenel

Experience

AI/ML Research Intern *Iowa City, IA, USA (Remote)*
ACT Inc. *June 2025 – Aug 2025*

- Carried out a human-centered design project for identifying design opportunities for question authoring tools for subject matter experts.
- Implemented a prototype for supporting question ideation through LLM-generated suggestions in a visual interface.

Research Engineer *London, UK (Remote)*
Vitamu *April 2022 – June 2023*

- Trained breast cancer detection and localization algorithms using **PyTorch** in a startup environment
- Trained and deployed deep learning models with **FastAPI** on **Google Cloud** for inference
- Migrated development architecture from **AWS** to **Google Cloud** and refactored development environments

R&D Engineer *Istanbul, Turkey*
Yapi Kredi Teknoloji *Aug 2021 – April 2022*

- Worked in the **NLP** team of the R&D department of Turkey's third largest bank
- Contributed to a ML pipeline written with **PyTorch** that processes more than 10k documents per day
- Integrated new classifiers into the existing microservice architecture with **Java**
- Designed a novel approach for parsing multi-page documents with multimodal embeddings, presented at **ICPR 2022** [10]

Teaching

Course Support, Breakthrough Tech *May 2025 - Aug 2025*

- Supported the small group discussions in the lectures for the 9-week ML Foundations course with 52 students.
- Provided feedback on the weekly assignments.

Lecturer, ITU ACM Student Chapter *Sept 2022 - Dec 2022*

- Held introductory Python lectures and supervised hands-on tutorial sessions for more than 100 students.

Guide & Mentor, inzva.com *Oct 2021 - Nov 2022*

- Contributed to Google Developers Machine Learning Bootcamp and deep learning study groups at inzva

hackerspace in Istanbul

- Gave lectures on object detection, face recognition, and neural style transfer to more than 100 students as part of the bootcamp
- Mentored more than 30 students in 4-week periods over a year

Skills

Code & Technologies: Python, PyTorch, JavaScript, C++/C, HTML/CSS, Docker, Bashscript, AWS/Cloud Technologies

Research Methods: Mixed Methods Research, Semi-structured Interviews, Think-aloud Studies, Educational Data Mining, Student Modeling

Undergraduate Mentorship

Claire Zheng, *Fall 2024 - present*

- Contributed on two projects as a co-author, including data processing, data analysis, writing, and conducting pilot studies [2, 3]

Nicole Hu, *Spring 2024*

- Contributed on one projects as a co-author, including data processing and annotation [7]

Panels and Workshops

Panel, SIGCSE Virtual 2024 *December 2024*

- Moderated the panel *Challenges and Solutions for Teaching Decomposition and Planning Skills in CS1* [8], with Dr Eliane S Wiese, James Finnie-Ansley, Dr Rodrigo Duran, Dr Kathryn Cunningham

Doctoral Consortium, EDM 2024 *July 2024*

- Attended the doctoral consortium workshop at EDM 2024, led by Dr Neil Heffernan
- Presented *Identifying and Evaluating Novel Knowledge Component Models for Programming Skills* [5] as a poster

Doctoral Consortium, SIGCSE Virtual 2024 *December 2024*

- Attended the doctoral consortium workshop at SIGCSE Virtual 2024, led by Dr Colleen Lewis and Dr Lauri Malmi

Publication List

** denotes equal contribution.*

Full Papers

[FP1] Y. Jain*, **M. A. Demirtaş***, and K. Cunningham. "PLAID: Supporting Computing Instructors to Identify Domain-Specific Programming Plans at Scale". In: *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems*. 2025, pp. 1–21.

[FP3] **M. A. Demirtaş**, C. Zheng, M. Fowler, and K. Cunningham. "Generating Planning Feedback for Open-Ended Programming Exercises with LLMs". In: *International Conference on Artificial Intelligence in Education*. Springer Nature Switzerland. 2025, pp. 33–48.

[FP6] **M. A. Demirtaş**, M. Fowler, and K. Cunningham. "Reexamining Learning Curve Analysis in Programming Education: The Value of Many Small Problems". In: *Proceedings of the 17th International Conference on Educational Data Mining*. International Educational Data Mining Society. 2024, pp. 53–67.

[FP7] **M. A. Demirtaş**, M. Fowler, N. Hu, and K. Cunningham. "Validating, Refining, and Identifying Programming Plans Using Learning Curve Analysis on Code Writing Data". In: *Proceedings of the 2024 ACM Conference on International Computing Education Research-Volume 1*. 2024, pp. 263–279.

[FP9] A. Waibel, M. Behr, D. Yaman, F. I. Eyiokur, T.-N. Nguyen, C. Mullov, **M. A. Demirtaş**, A. Kantarci, S. Constantin, and H. K. Ekenel. "Face-Dubbing++: Lip-synchronous, voice preserving translation of videos". In: *2023 IEEE International Conference on Acoustics, Speech, and Signal Processing Workshops (ICASSPW)*. IEEE. 2023, pp. 1–5.

[FP10] **M. A. Demirtaş**, B. Oral, M. Y. Akpınar, and O. Deniz. "Semantic Parsing of Interpage Relations". In: *26th International Conference on Pattern Recognition*. 2022.

[FP12] M. Hanik*, **M. A. Demirtaş***, M. A. Gharsallaoui, and I. Rekik. "Predicting cognitive scores with graph neural networks through sample selection learning". In: *Brain Imaging and Behavior* 16.3 (2021), pp. 1123–1138.

Short Papers

[SP4] R. Sampaio de Alencar, **M. A. Demirtaş**, A. S. Saha, Y. Shi, and P. Brusilovsky. "Integrating Expert Knowledge With Automated Knowledge Component Extraction for Student Modeling". In: *Proceedings of the 33rd ACM Conference on User Modeling, Adaptation and Personalization*. 2025, pp. 307–312.

[SP11] S. Yürekli, **M. A. Demirtaş**, and I. Rekik. "Quantifying the Predictive Uncertainty of Regression GNN Models Under Target Domain Shifts". In: *Predictive Intelligence in Medicine: 5th International Workshop, PRIME 2022, Held in Conjunction with MICCAI 2022, Singapore, September 22, 2022, Proceedings*. Springer Nature Switzerland Cham. 2022, pp. 149–159.

Posters & Extended Abstracts

[PEA2] **M. A. Demirtaş**, C. Zheng, and K. Cunningham. "Detecting Programming Plans in Open-ended Code Submissions". In: *Proceedings of the 56th ACM Technical Symposium on Computer Science Education V. 2*. 2025, pp. 1435–1436.

[PEA5] **M. A. Demirtaş**. "Identifying and Evaluating Novel Knowledge Component Models for Programming Skills". In: *Proceedings of the 17th International Conference on Educational Data Mining*. Ed. by B. PaaÃŸen and C. D. Epp. Atlanta, Georgia, USA: International Educational Data Mining Society, July 2024, pp. 969–973. ISBN: 978-1-7336736-5-5. DOI: 10.5281/zenodo.12730015.

[PEA8] E. S. Wiese, J. Finnie-Ansley, R. Duran, K. Cunningham, and **M. A. Demirtaş**. "Challenges and Solutions for Teaching Decomposition and Planning Skills in CS1". In: *Proceedings of the 2024 on ACM Virtual Global Computing Education Conference V. 2*. 2024, pp. 291–292.