ALI REZA IBRAHIMZADA

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EDUCATION

University of Illinois Urbana-Champaign **Illinois, USA**
Doctor of Philosophy in Computer Science; GPA: 4.00/4.00 *Aug 2022 - May 2027*
Thesis: Neuro-Symbolic Code Translation and Validation using Large Language Models
Advisor: Reyhaneh Jabbarvand

University of Illinois Urbana-Champaign **Illinois, USA**
Master of Science in Computer Science; GPA: 4.00/4.00 *Aug 2022 - Dec 2024*
Thesis: Bridging the Gap between Testing and Debugging through Explainable Deep Oracles
Advisor: Reyhaneh Jabbarvand

Marmara University **Istanbul, Turkey**
Bachelor of Science in Computer Engineering; GPA: 3.98/4.00 *Aug 2018 - Jul 2022*
Thesis: Depth Estimation of Stereo Images using Deep Learning
Advisor: Mehmet Kadir Baran

HONORS AND AWARDS

School Nomination for the Two Sigma PhD Fellowship *Nov 2024*
Nominated by the Siebel School of Computing and Data Science at the University of Illinois Urbana-Champaign (top 1%)

IEEE/ACM Student Research Competition *Apr 2024*
Ranked 3rd in IEEE/ACM Student Research Competition at International Conference on Software Engineering (ICSE) 2024

Valedictorian of Class of 2022 *Sep 2022*
Ranked 1st among roughly 1000 graduates in the Engineering Faculty and the Department of Computer Engineering at Marmara University

Summa Cum Laude (High Honors) *Sep 2022*
Summa Cum Laude (High Honors) Award for graduating with 3.98 / 4.00 GPA at Marmara University

Ray Ozzie Computer Science Fellowship *Aug 2022*
Full tuition waiver and monthly stipend during the first year of PhD program at the University of Illinois Urbana-Champaign

The Best Senior Graduation Project of the Year *Jun 2022*
Our project "Depth Estimation of Stereo Images using Deep Learning" has been awarded The Best Graduation Project of the Year by the Department of Computer Engineering at Marmara University

Academic Achievement Scholarship *Jul 2019*
100% tuition waiver in accordance with high GPA in 2019-2020, 2020-2021, and 2021-2022 academic years, awarded by Istanbul Sehir University & Marmara University

Valedictorian of High School *Jan 2017*
Graduated as the Valedictorian in High School with 3.96/4.00 GPA, awarded by KEN

PUBLICATIONS

Pre-prints

P1. C. Liu, S. D. Zhang, **A. R. Ibrahimzada**, and R. Jabbarvand, *"CodeMind: A Framework to Challenge Large Language Models for Code Reasoning"*, arXiv preprint arXiv:2402.09664 [link to full paper]

Conference Publications

C1. **A. R. Ibrahimzada**, Y. Chen, R. Rong, and R. Jabbarvand, *"Challenging Bug Prediction and Repair Models with Synthetic Bugs"*, IEEE International Conference on Source Code Analysis & Manipulation (SCAM), Auckland, New Zealand, September 2025

C2. **A. R. Ibrahimzada**, K. Ke, M. Pawagi, M. S. Abid, R. Pan, S. Sinha, and R. Jabbarvand, *"AlphaTrans: A Neuro-Symbolic Compositional Approach for Repository-Level Code Translation and Validation"*, ACM Conference on Foundations of Software Engineering (FSE), Trondheim, Norway, June 2025

C3. **A. R. Ibrahimzada**, *"Program Decomposition and Translation with Static Analysis"*, IEEE/ACM International Conference on Software Engineering Student Research Competition (ICSE SRC), Lisbon, Portugal, April 2024

C4. R. Pan*, **A. R. Ibrahimzada***, R. Krishna, D. Sankar, LP. Wassi, M. Merler, B. Sobolev, R. Pavuluri, S. Sinha, and R. Jabbarvand, *"Lost in Translation: A Study of Bugs Introduced by Large Language Models while Translating Code"*, IEEE/ACM International Conference on Software Engineering (ICSE), Lisbon, Portugal, April 2024

C5. **A. R. Ibrahimzada**, Y. Varli, D. Tekinoglu, and R. Jabbarvand, *"Perfect Is the Enemy of Test Oracle"*, The ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), Singapore, Singapore, November 2022

C6. A. Cakmak, **A. R. Ibrahimzada**, S. Arikan, H. Ayaz, S. Demirkol, D. Sonmez, M. T. Hakan, S. S. Turan, C. Horozoglu, O. Kucukhuseyin, B. Kiran, S. U. Zeybek, M. Baysan, and I. Yaylim, *"Predicting the Predisposition to Colorectal Cancer based on SNP Profiles of Immune Checkpoints Using Supervised Learning Models"*, VII. International Molecular Medicine Congress, Istanbul, Turkey, September 2019 [Link to oral presentation]

Journal Publications

J1. A. Cakmak, H. Ayaz, S. Arıkan, **A. R. Ibrahimzada**, Ş. Demirkol, D. Sönmez, M. T. Hakan, S. T. Sürmen, C. Horozoğlu, M. B. Doğan, Ö. Küçükhüseyin, C. Cacına, B. Kıran, Ü. Zeybek, M. Baysan, and İ. Yaylım, *"Predicting the predisposition to colorectal cancer based on SNP profiles of immune phenotypes using supervised learning models"*, Medical & Biological Engineering & Computing, Springer Berlin Heidelberg, Vol. 61, 243–258, 2023

J2. G. N. Sohsah, **A. R. Ibrahimzada**, H. Ayaz, and A. Cakmak, *"Scalable Classification of Organisms into a Taxonomy Using Hierarchical Supervised Learners"*, Journal of Bioinformatics and Computational Biology, World Scientific Publishing Co., Vol. 18, No. 05, 2020

WORK EXPERIENCE

University of Illinois Urbana-Champaign — **Illinois, USA**
Graduate Research Assistant — *Aug 2022 - Present*

- **LLMs for Code:** Working on Code LLMs for source code generation, understanding and translation under the supervision of Reyhaneh Jabbarvand.

Amazon AWS **Virginia, USA**
Applied Scientist Intern *May 2025 - August 2025*

- **Code Translation:** Working on validation and repair of repository-level code translation using LLM agents under the supervision of Brandon Paulsen and Josiah Dodds.

IBM Research **New York, USA**
Research Intern *May 2024 - August 2024*

- **Code Translation:** Working on repository-level code translation under the supervision of Saurabh Sinha and Reyhaneh Jabbarvand.
  Published in the ACM FSE in June 2025

IBM Research **New York, USA**
Research Intern *May 2023 - August 2023*

- **Code Translation:** Working on applications of LLMs for code translation under the supervision of Saurabh Sinha, Rangeet Pan, Rahul Krishna, Raju Pavuluri, and Reyhaneh Jabbarvand.
  Published in the IEEE/ACM ICSE in April 2024

University of Illinois Urbana-Champaign **Illinois, USA**
Undergraduate Research Intern *May 2021 - Aug 2022*

- **Test Oracle Inference:** Design and development of an interpretable neural model to improve the performance of test oracles under the supervision of Reyhaneh Jabbarvand.
  Published in the ACM Joint ESEC/FSE in November 2022

Marmara University **Istanbul, Turkey**
Undergraduate Researcher *Jul 2021 - Jul 2022*

- **Depth Perception:** Developing and investigation of an attention-based neural model for estimating depth in stereo images under the supervision of Mehmet Kadir Baran.
  Awarded the Best Senior Graduation Project of the Year in June 2022

Istanbul Technical University **Istanbul, Turkey**
Undergraduate Researcher & Research Intern *Jun 2020 - Feb 2022*

- **Academic Success:** Designing and implementation of a clustering-based framework for predicting student success in courses under the supervision of Ali Cakmak.
  Manuscript under review in IEEE TLT

- **SARS-Cov-2 Mutation:** Working on deep learning approaches to predict future Covid-19 mutations under the supervision of Ali Cakmak.

Istanbul Sehir University **Istanbul, Turkey**
Undergraduate Researcher *Jun 2019 - Jun 2020*

- **2-Step Taxonomy:** Designing hierarchical supervised learners for classification of living organisms under the supervision of Ali Cakmak.
  Published in the Journal of Bioinformatics and Computational Biology in October 2020

- **Colorectal Cancer:** Developing machine learning models for predicting colorectal cancer under the supervision of Ali Cakmak.
  Published in the VII. International Molecular Medicine Congress in September 2019
  Extended work published in Medical & Biological Engineering & Computing in October 2022

PROFESSIONAL ACTIVITIES

University of Illinois Urbana-Champaign **Illinois, USA**
Mentoring and Supervising Interns *Jun 2022 - Present*

- Muhammad Salman Abid (PhD, Cornell University - USA)
- Mrigank Pawagi (BS, Indian Institute of Science - India)
- Palak Kotwani (BS, University of Illinois Urbana-Champaign - USA)
- Chung-En Ho (BS, National Taiwan University - Taiwan)
- Yung-Wen Huang (BS, National Taiwan University - Taiwan)
- Eren Polat (BS, Bilkent University - Turkey)
- Lily Yang (BS, University of Waterloo - Canada)
- Ryan Rong (Peddie High School - USA)
- Zelin Wang (BS, Nanjiang University / UC Berkeley - China / USA)

University of Illinois Urbana-Champaign **Illinois, USA**
Summer Research Experience for Undergraduates (REU) participant *May 2021 - Aug 2021*

GRANTS

Travel Grants

- US NSF travel grant to attend ICSE 2024 in Lisbon, Portugal
- ACM SIGSOFT CAPS travel grant to attend ESEC/FSE 2022 in Singapore, Singapore
- UIUC CS travel grant to attend ESEC/FSE 2022 in Singapore, Singapore
- KEN travel grant to attend QUEST-2015 in Lucknow, India

TALKS

Challenging Bug Prediction and Repair Models with Synthetic Bugs

- SCAM 2025, The University of Auckland, Auckland, New Zealand — September 2025

AlphaTrans: A Neuro-Symbolic Compositional Approach for Repository-Level Code Translation and Validation

- FSE 2025, Clarion Hotel Trondheim, Trondheim, Norway — June 2025

Lost in Translation: A Study of Bugs Introduced by Large Language Models while Translating Code

- ICSE 2024, Centro Cultural de Belém, Lisbon, Portugal — April 2024

Perfect Is the Enemy of Test Oracle

- ESEC/FSE 2022, National University of Singapore, Singapore — November 2022

SOFTWARE

AlphaTrans [GitHub]: A tool for repository-level compositional code translation and validation.

BugFarm [GitHub]: A tool for generating hard-to-detect and hard-to-repair software bugs.

Seer [GitHub]: A tool for automated test oracle construction using deep learning.

ACADEMIC SERVICES

Conference

C1. Reviewer: International Conference on Learning Representations (ICLR'25) 2025

C2. Reviewer: Mining Software Repositories (MSR@ICSE'25) 2025

C3. Reviewer: Artifact Evaluation (AE@ICSE'25) 2025

C4. Reviewer: Mining Software Repositories (MSR@ICSE'24) 2024