

Ali Reza Ibrahimzada

✉ alirezai@illinois.edu

in alibrahimzada

🌐 <https://alirezai.cs.illinois.edu/>

Research Interest

My research covers software engineering, artificial intelligence, and LLMs for code, with the goal of modernizing and enhancing the reliability of large-scale software systems. To this end, I leverage program analysis and LLMs to automatically translate and validate repository-level code across different programming languages. So far, my work has focused on evaluating LLMs in code translation and investigating translation bugs [C4], source code decomposition for code translation [C3], and building end-to-end neuro-symbolic repository-level code translation and validation tools [C2].

Beside code translation, I have also enjoyed working on other problems in software engineering [C1, C5] and machine learning for bioinformatics [J6, J7].


Education

- 08/22 – 12/26 📖 **Ph.D. Computer Science, University of Illinois Urbana-Champaign, IL, USA**
GPA: 4.00 / 4.00
Advisor: Reyhaneh Jabbarvand
Thesis: *Neuro-Symbolic Code Translation and Validation using Large Language Models*
- 08/22 – 12/24 📖 **M.Sc. Computer Science, University of Illinois Urbana-Champaign, IL, USA**
GPA: 4.00 / 4.00
Advisor: Reyhaneh Jabbarvand
Thesis: *Bridging the Gap between Testing and Debugging through Explainable Deep Oracles*
- 09/18 – 07/22 📖 **B.Sc. Computer Science, Marmara University, Istanbul, Turkey**
GPA: 3.98 / 4.00
Advisor: Mehmet Kadir Baran
Thesis: *Depth Estimation of Stereo Images using Deep Learning*



Research Publications

Conference Proceedings

- [C1] **A. R. Ibrahimzada**, Y. Chen, R. Rong, and R. Jabbarvand, “Challenging bug prediction and repair models with synthetic bugs,” in *2025 IEEE International Conference on Source Code Analysis and Manipulation (SCAM)*, 2025. 🔗 URL: <https://arxiv.org/abs/2310.02407>.
- [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,” *FSE*, vol. 2, New York, NY, USA: Association for Computing Machinery, Jun. 2025. 🔗 DOI: [10.1145/3729379](https://doi.org/10.1145/3729379).
- [C3] **A. R. Ibrahimzada**, “Program decomposition and translation with static analysis,” in *Proceedings of the 2024 IEEE/ACM 46th International Conference on Software Engineering: Companion Proceedings*, ser. ICSE-Companion ’24, Lisbon, Portugal: Association for Computing Machinery, 2024, pp. 453–455, ISBN: 9798400705021. 🔗 DOI: [10.1145/3639478.3641226](https://doi.org/10.1145/3639478.3641226).
- [C4] R. Pan*, **A. R. Ibrahimzada***, R. Krishna, D. Sankar, L. P. 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,” in *Proceedings of the IEEE/ACM 46th International Conference on Software Engineering*, ser. ICSE ’24, Lisbon, Portugal: Association for Computing Machinery, 2024, ISBN: 9798400702174. 🔗 DOI: [10.1145/3597503.3639226](https://doi.org/10.1145/3597503.3639226).

- [C5] **A. R. Ibrahimzada**, Y. Varli, D. Tekinoglu, and R. Jabbarvand, "Perfect is the enemy of test oracle," in *Proceedings of the 30th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering*, ser. ESEC/FSE 2022, Singapore, Singapore: Association for Computing Machinery, 2022, pp. 70–81, ISBN: 9781450394130.  DOI: [10.1145/3540250.3549086](https://doi.org/10.1145/3540250.3549086).

Journal Articles

- [J1] A. Cakmak, H. Ayaz, S. Arıkan, **A. R. Ibrahimzada**, Ş. Demirkol, D. Sönmez, M. T. Hakan, S. T. Sürmen, C. Horozoglu, M. B. Doğan, Ö. Küçük hüseyin, 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*, vol. 61, no. 1, pp. 243–258, Jan. 2023, ISSN: 1741-0444.  DOI: [10.1007/s11517-022-02707-9](https://doi.org/10.1007/s11517-022-02707-9).
- [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*, vol. 18, no. 05, p. 2 050 026, 2020, PMID: 33125294.  DOI: [10.1142/S0219720020500262](https://doi.org/10.1142/S0219720020500262). eprint: <https://doi.org/10.1142/S0219720020500262>.

Thesis

- [T1] **A. R. Ibrahimzada**, *Bridging the gap between testing and debugging through explainable deep oracles*, 2024.





Professional Experience

- | | |
|-----------------|---|
| 08/22 – Present |  Research Assistant , University of Illinois Urbana-Champaign, IL, USA
Advised by: Reyhaneh Jabbarvand
Topic: Code LLMs for Source Code Generation, Understanding and Translation |
| 05/25 – 08/25 |  Applied Scientist Intern , Amazon Web Services, VA, USA
Hosted by: Brandon Paulsen and Joey Dodds
Topic: LLM Agents for Autonomous Translation Validation and Repair |
| 05/24 – 08/24 |  Research Intern , IBM Research, NY, USA
Hosted by: Saurabh Sinha and Raju Pavuluri
Topic: End-to-end Repository-level Code Translation and Validation |
| 05/23 – 08/23 |  Research Intern , IBM Research, NY, USA
Hosted by: Saurabh Sinha and Raju Pavuluri
Topic: Evaluating LLMs in Code Translation and Bug Analysis |
| 05/21 – 08/22 |  Research Intern , University of Illinois Urbana-Champaign, IL, USA
Hosted by: Reyhaneh Jabbarvand
Topic: Neural and Interpretable Test Oracles using Deep Learning |
| 06/19 – 02/22 |  Research Intern , Istanbul Technical University, Istanbul, Turkey
Hosted by: Ali Cakmak
Topic: Machine Learning for Bioinformatics |





Awards

- | | |
|------|--|
| 2024 |  Nomination for the Two Sigma PhD Fellowship , University of Illinois Urbana-Champaign |
| |  3rd in Student Research Competition @ ICSE'24 , ACM |
| |  Travel Grant to attend ICSE'24 in Lisbon, Portugal , NSF |
| 2022 |  Travel Grant to attend ESEC/FSE'22 in Singapore, Singapore , ACM |
| |  Valedictorian of Class of 2022 , Marmara University |
| |  Ray Ozzie Computer Science Fellowship , University of Illinois Urbana-Champaign |




Awards (continued)

- 2019  **Best Senior Graduation Project of the Year**, Marmara University
- 2019  **Academic Achievement Scholarship**, Marmara University
- 2017  **Valedictorian of High School**, KEN
- 2015  **Travel Grant to attend QUEST'15 in Lucknow, India**, KEN



Talks

- SCAM'25  Challenging Bug Prediction and Repair Models with Synthetic Bugs, Auckland, New Zealand
- FSE'25  AlphaTrans: A Neuro-Symbolic Compositional Approach for Repository-Level Code Translation and Validation, Trondheim, Norway
- ICSE'24  Lost in Translation: A Study of Bugs Introduced by Large Language Models while Translating Code, Lisbon, Portugal
- FSE'22  Perfect Is the Enemy of Test Oracle, Singapore, Singapore



Skill Stack

- Programming Languages  Python, Java, JavaScript, Rust, C, OCaml
- Common  Docker, Vim, Git, SQL
- Machine Learning  PyTorch, TensorFlow, vLLM, Codex, Claude Code

Service


- Program Committee  ICLR'26, ICLR'25, MSR'25, MSR'24
- Artifact Evaluation  ICSE'25
- Organizing  ReCode@ICSE'26

Teaching Experience


- Fall 2025  CS 421 - Programming Languages and Compilers
- Spring 2025  CS 447 - Natural Language Processing

References


Reyhaneh Jabbarvand

Assistant Professor
University of Illinois Urbana-Champaign
201 N Goodwin Ave, 61801, Urbana, IL
 reyhaneh@illinois.edu


Darko Marinov

Professor
University of Illinois Urbana-Champaign
201 N Goodwin Ave, 61801, Urbana, IL
 marinov@illinois.edu

Saurabh Sinha

Research Scientist
IBM Research
1101 Kitchawan Rd, 10598, Yorktown Heights, NY
 sinhas@us.ibm.com

Brandon Paulsen

Applied Scientist
Amazon Web Services
1400 S Eads St, 22202, Arlington, VA
 bpaulse@amazon.com