

KAMEL ALRASHEDY

LinkedIn ◇ Google Scholar
+1 470 815 4144 ◇ kalrashedy3@gatech.edu

EDUCATION

Georgia Institute of Technology Ph.D. in Computer Science Thesis Topic: Feedback-Guided LLM Reasoning: A Unified Closed-Loop Framework for Code Generation and Decision Making	August 2021 - Present
University of Victoria M.Sc. in Computer Science Thesis Topic: Predicting programming language of questions and snippets of stack overflow	Jan 2016 - August 2018
University of Hail B.Sc. in Computer Education Thesis Topic: Analysis of keystroke dynamics based on different languages for representing user's typing behavior	August 2008 - May 2013

SELECTED PUBLICATIONS

1. **Kamel Alrashedy**, et al., “*Generating CAD Code with Vision–Language Models for 3D Designs*”. International Conference on Learning Representations (ICLR). May 2025
2. **Kamel Alrashedy**, et al., “*Learning Defect Prediction from Unrealistic Data*”. IEEE International Conference on Software Analysis, Evolution and Reengineering. March 2023
3. **Kamel Alrashedy**, et al., “*Leveraging Static Analysis for Feedback-Driven Security Patching in LLM-Generated Code*”. Journal of Cybersecurity and Privacy 5(4), 110. December 2024
4. **Kamel Alrashedy**, et al., “*How do Software Engineering Researchers Use GitHub? An Empirical Study of Artifacts & Impact*”. IEEE International Conference on Source Code Analysis & Manipulation.
5. **Kamel Alrashedy**, et al., “*Sc++: Predicting the programming language of questions and snippets of stack overflow*”. Journal of Systems and Software. June 2020
6. **Kamel Alrashedy**, et al., “*Constraints-of-Thought: A Framework for Constrained Reasoning in Language-Model-Guided Search*”. Under review. 2026
7. **Kamel Alrashedy**, et al., “*Reinforcement Learning from Verbal Feedback as Sequential Feedback-Guided Decision Making*”. In progress. 2026

SKILLS AND INTERESTS

Interests	Code Generation, Large Language Models, LLM Post-training, Feedback Loop, Reinforcement Learning, Alignment, Agentic AI, Developer Productivity
Skills	Python (PyTorch, HuggingFace, LangChain), Reinforcement Learning (MCTS, Policy Optimization) Fine-tuning (LoRA, QLoRA, PEFT), Reward Modeling, Planning with Tools, Memory Systems (RAG, vector DBs), Autonomous Agents, Execution Feedback Loops

RESEARCH PROJECTS

- Automated CAD Code Generation and Verification using Vision–Language Models** 2023 – Present
- Developed a closed-loop framework for generating parametric CAD models from natural language using large Vision–Language Models (VLMs).
 - Designed an automated verification pipeline that validates geometric structure, dimensional constraints, and code executability using rendered visual feedback.
 - Evaluated the approach on a benchmark of expert-annotated CAD programs, demonstrating improved structural alignment and reduced geometric error.

Feedback-Driven Security Patching (FDSP) for LLM-Generated Code	2023 – Present
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- Developed a feedback-driven refinement framework that detects vulnerabilities and iteratively patches code while preserving intended functionality
- Integrated static analysis feedback into the generation loop to guide targeted code corrections
- Demonstrated significant reduction in detected vulnerabilities with high functional correctness across multiple programming tasks

Constraints-of-Thought: Constraint Guided Reasoning for LLM-Driven Planning 2025 – Present

- Developed Constraints-of-Thought, a structured reasoning framework that represents each step as an (intent, constraint) pair to guide and prune search
- Integrated constraint guided reasoning with Monte Carlo Tree Search (MCTS) to reduce branching factor and focus exploration on semantically valid actions
- Evaluated the framework across multiple domains including strategic game planning, CAD code generation, and arithmetic reasoning, demonstrating improved accuracy and structural alignment over baselines

PROFESSIONAL EXPERIENCE

Software Developer, Advanced Electronics Company Jan 2020 - August 2021

- Developed backend services and MVC-based web applications using C# and the .NET framework.
- Designed and consumed RESTful APIs to support scalable enterprise applications.
- Implemented interactive front-end components using JavaScript, jQuery, HTML, and CSS.
- Designed, queried, and maintained relational databases using SQL and Oracle.
- Used Git for version control and collaborated within team-based development workflows.

Research Student, King Abdullah University of Science and Technology Jan 2019 - August 2019

- Worked on *Delve*, a dataset-driven scholarly search and analysis platform.
- Developed data processing pipelines to extract, link, and analyze datasets referenced in scientific publications.
- Implemented search components and visualizations to capture relationships between papers and datasets.
- Applied information retrieval and data mining techniques to improve dataset discovery and relevance ranking.

TEACHING EXPERIENCE

Teaching Assistant, Software Engineering Courses August 2021 - August 2024

- Assisted in delivering undergraduate software engineering courses.
- Led lab sessions and office hours, providing guidance on programming assignments and projects.
- Graded assignments and exams, and provided detailed feedback to students.
- Supported course logistics and coordination with the course instructor.

ACADEMIC SERVICE

- Conference Reviewer: ICLR 2025-2026, ICRA 2024, NeurIPS 2024-2025, EMNLP 2026
- Conference Volunteer: ICSE 2023, CVC 2018

STUDENT MENTORING

- Vriksha Srihari: Master's student at Georgia Tech.
- Adam Cahll: Master's student at Georgia Tech.
- Vadeeng Chopra: Master's student at Georgia Tech.
- Ahmed Binjahlan: Undergrad student at Georgia Tech.
- Abdullah AlJasser: Undergrad student at Georgia Tech.

REFERENCES

Prof. Matthew Gombolay, Ph.D. Advisor

Associate Professor, School of Interactive Computing

Georgia Institute of Technology

Email: matthew.gombolay@cc.gatech.edu