

Georgios Sakkas

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WORK EXPERIENCE

Microsoft Research (Redmond, WA, U.S.A.) Jun. 2022 - Sep. 2022

- **Research Intern** at the *Research in Software Engineering (RiSE)* group working with Shuvendu Lahiri
- Publication on *interactive code generation via test-driven user intent formalization*, using program synthesis, static analysis, and state-of-the-art LLMs (Codex, InCoder, CodeGen etc.)

Amazon.com (San Francisco, CA, U.S.A.) Jun. 2021 - Sep. 2021

- **Applied Scientist Intern** at the *CodeGuru Reviewer* team of the Automated Reasoning group
- Extended a *taint-analysis tool's data-flow operations* to capture constraints and add path sensitivity to the analysis

Bloomberg L.P. (New York, NY, U.S.A.) Jun. 2020 - Aug. 2020

- **Software Engineer Intern** at the *Static Analysis & Automated Refactoring* team of the Developer Experience group
- Implemented a *new automated control-flow refactoring tool* for legacy Fortran code

PwC (Athens, Greece) Sep. 2017 - Oct. 2017

- **Intern** in the *System & Data Assurance* team of the Risk Assurance Services department
- Implemented a *new authorization hierarchy in SAP* and developed *data analysis scripts* for the team & customers

ACADEMIC RESEARCH EXPERIENCE

UC San Diego, U.S.A. Sep. 2018 - Present

- **PhD Candidate** at the Programming Systems group — *Advisor*: Prof. Ranjit Jhala
- *Focus*: Neurosymbolic Program Repair using Programming Languages & Machine Learning research, including Formal Methods, Static Analysis, Neural Networks & LLMs

National Technical University of Athens, Greece Nov. 2016 - Jul. 2018


- **Research Assistant** at the Software Engineering Lab (Softlab) — *Supervisor*: Associate Prof. Nikolaos Papaspyrou
- *Thesis*: Resumption Monad Transformers and their Applications in the Semantics of Concurrency

Rutgers, The State University of New Jersey, U.S.A. Jul. 2016 - Aug. 2016

- **Visiting Research Student** at the ParaMathics group — *Supervisor*: Assistant Prof. Maryam Dehnavi
- Worked on High Performance Computing, Parallel Computing, Testing in HPCs (XSEDE, Stampede)
- *Cache Oblivious Algorithms*: Implemented algorithms in a Cache Oblivious manner in C/C++ & parallel versions of them using OpenMP, Cilk and MPI; Tested on XSEDE supercomputers for scalability and performance

PUBLICATIONS

1. **Neurosymbolic Modular Refinement Type Inference** – G. Sakkas, P. Sahu, K. Ong, R. Jhala. Submitted to ICSE 2025.
2. **Exploring the Effectiveness of LLM based Test-driven Interactive Code Generation: User Study and Empirical Evaluation** – Sarah Fakhoury*, Aaditya Naik*, Georgios Sakkas*, Saikat Chakraborty, Madan Musuvathi, Shuvendu K Lahiri (*equal contribution). International Conf. on Software Engineering: Companion Proceedings (ICSE) 2024. [📄](#)
3. **Seq2Parse: Neurosymbolic Parse Error Repair** – Georgios Sakkas, Madeline Endres, Philip J. Guo, Westley Weimer, and Ranjit Jhala. Proceedings of the ACM on Programming Languages 6, Article 167 (OOPSLA) 2022. [📄](#) [🗨️](#)
4. **Interactive Code Generation via Test-Driven User-Intent Formalization** – Shuvendu K Lahiri*, Aaditya Naik*, Georgios Sakkas*, Piali Choudhury, Curtis von Veh, Madanlal Musuvathi, Jeevana Priya Inala, Chenglong Wang and Jianfeng Gao (*equal contribution). arXiv preprint Aug. 2022. [📄](#)
5. **Type Error Feedback via Analytic Program Repair** – Georgios Sakkas, Madeline Endres, Benjamin Cosman, Westley Weimer and Ranjit Jhala. Programming Languages Design and Implementation (PLDI) 2020. [📄](#) [🗨️](#)
6. **PABLO: Helping Novices Debug Python Code Through Data-Driven Fault Localization** – Benjamin Cosman, Madeline Endres, Georgios Sakkas, Leon Medvinsky, Yao-Yuan Yang, Ranjit Jhala, Kamalika Chaudhuri and Westley Weimer. Special Interest Group on Computer Science Education (SIGCSE) Technical Symposium 2020. [📄](#)

7. **InFix: Automatically Repairing Novice Program Inputs** – Madeline Endres, **Georgios Sakkas**, Benjamin Cosman, Ranjit Jhala and Westley Weimer. Automated Software Engineering (ASE) 2019. 
8. **AIRMS: A Risk Management Tool using Machine Learning** – Spyros K. Chandrinou, **Georgios Sakkas** and Nikos D. Lagaros. Journal of Expert Systems with Applications, Volume 105, 1 September 2018.

ACADEMIC SERVICE

	PhD Application Mentoring Program
2023 - Present	- PhD application review, feedback & guidance for prospective students
	UC San Diego
2020 - Present	- <i>Teaching Assistant (TA)</i> : <ul style="list-style-type: none">• CSE130 (Undergrad. Programming Languages) – Spring & Winter 2024, Winter 2021, Winter 2020• CSE230 (Grad. Programming Languages) – Fall 2023, Fall 2021
2021 - 2022	- CSE Diversity, Equity, and Inclusion (DEI) Committee PhD application reviewer
2021	- CSE Research Virtual Open House poster presentation
2020 - 2023	- PhD Visit Days participation
	Conference Service
2018	- SPAWC 2018 volunteer

EDUCATION

Sep. 2018 - Present	UC San Diego, U.S.A. (GPA: 3.96/4.0) <ul style="list-style-type: none">- PhD Candidate & Master's in Computer Science & Engineering- (Ongoing) Thesis: Neurosymbolic Program Repair
Oct. 2012 - Jul. 2018	National Technical University of Athens, Greece (GPA: 9.18/10) <ul style="list-style-type: none">- Diploma in Electrical & Computer Engineering (5-year joint degree)- Bachelor & Master's Equivalent – Top 2% of class – Awarded “Excellent” degree status- Major (6th - 10th Semesters): Computer Science (GPA: 9.52/10)
2009 - 2012	4th Lyceum of Kalamata, Greece (GPA: 19.4/20) <ul style="list-style-type: none">- Apolytirion - Valedictorian of class – Graduated with “Prefecture Distinction”- Top 1% in National University Entrance Exams (Grade: 19,312/20,000)

AWARDS & DISTICTIONS

- **Top 5% & top 10% globally** in IEEE's 24-hour programming contest IEEEExtreme 11.0 & IEEEExtreme 10.0 respectively (October 2017 & October 2016).
- Joint **1st place** in EESTech Challenge (Local Round) on Machine Learning algorithms (April 2017).
- **16th (top 1%)** at the 3rd & final round of Greek National Programming Competition (2011-2012).
- Semi-finalist in Google's Code Jam 2016 & 2017 programming competition.
- Finalist at Greek Mathematics competition for 3 consecutive years and Greek Physics competition (2010-2012).
- Participation with fellow classmates in Google's Hash Code 2016 & 2017 programming competition.
- Finalist team in the “Business Talents” management and decisions contest (2013).

SKILLS

Programming Languages	<i>Excellent knowledge:</i> Python, Haskell, JavaScript, C, C++, Java, Go, OCaml, Bash <i>Working experience:</i> Prolog, Matlab, Fortran, PHP, MySQL, Assembly languages (80x86)
Languages	Greek (native), English (level C2, TOEFL – 104/120), German (level B2), Japanese (Beginner)
Interests	Drawing & Oil painting, Basketball, Photography & Videography, Science fiction literature