





Ben Limpanukorn





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Education

- 2022 – Present  **Ph.D., University of California, Los Angeles (UCLA)** Computer Science
- 2021 – 2022  **M.S., University of California, Los Angeles (UCLA)** in Computer Science.
Capstone: *Challenges and Methods for Testing NVMe SSD Devices using Software Fuzzing.*
- 2017 – 2021  **B.S., University of California, Los Angeles (UCLA)** in Computer Science and Engineering.

Publications

- 1 **Ben Limpanukorn**, Jiyuan Wang, Hong Jin Kang, Zitong Zhou, and Miryung Kim. “Fuzzing MLIR Compilers with Custom Mutation Synthesis”. In: *2025 IEEE/ACM 47th International Conference on Software Engineering (ICSE)*. 2025, pp. 217–229.  DOI: 10.1109/ICSE55347.2025.00037.
- 2 Jai Parera, Nathan Huey, **Ben Limpanukorn**, and Miryung Kim. “Chrysalis: A Lightweight Logging and Replay Framework for Metamorphic Testing in Python”. In: *2025 IEEE/ACM 40th International Conference on Automated Software Engineering (ASE)*. 2025.
- 3 Jiyuan Wang, Yuxin Qiu, **Ben Limpanukorn**, Hong Jin Kang, Qian Zhang, and Miryung Kim. “DuoReduce: Bug Isolation for Multi-layer Extensible Compilation”. In: *Proc. ACM Softw. Eng.* 2.FSE (June 2025).  DOI: 10.1145/3715747.
- 4 Joshua M. Clifford, **Ben Limpanukorn**, and Edward S. Jimenez. “An Improved Process to Colorize Visualizations of Noisy X-Ray Hyperspectral Computed Tomography Scans of Similar Materials”. In: *2022 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC)*. 2022, pp. 1–4.  DOI: 10.1109/NSS/MIC44845.2022.10399061.
- 5 Joshua Clifford, Emily Kemp, **Ben Limpanukorn**, and Edward S. Jimenez. “A Process to Colorize and Assess Visualizations of Noisy X-Ray Computed Tomography Hyperspectral Data of Materials with Similar Spectral Signatures”. In: *2021 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC)*. 2021, pp. 1–8.  DOI: 10.1109/NSS/MIC44867.2021.9875740.

Preprints

- 1 **Ben Limpanukorn**, Yanjun Wang, Zach Patterson, Pranav Garg, Murali Krishna Ramanathan, Xiaofei Ma, Anoop Deoras, and Miryung Kim. *Structural Code Search using Natural Language Queries*. 2025. arXiv: 2507.02107 [cs.SE].  URL: <https://arxiv.org/abs/2507.02107>.

Experience

2022 – Present

📌 **Graduate Student Researcher** SEAL Lab at UCLA.

- Automating the specialization of domain-specific fuzzers to reduce manual effort by extracting knowledge from existing software artifacts like tests, code, and error feedback.
- Designed SynthFuzz to automatically infer context-sensitive mutations from test cases, matching the branch coverage of domain-specific fuzzers with minimal manual effort [1].
- Developed a framework that uses LLMs to infer semantic constraints from error feedback, automatically repairing inputs to eliminate shallow errors and expose deeper, previously shadowed bugs.
- Developing a scalable technique to dynamically specialize grammars during fuzzing by learning common patterns from valid inputs, improving fuzzing efficiency without the high cost of full grammar inference.
- Advised graduate students to develop a lightweight logging and replay framework for metamorphic testing [2].

Jun – Dec 2024

📌 **Applied Science Intern** Amazon Web Services.

- Developed a new approach to structural code search by translating natural language queries into domain-specific languages like Semgrep and GraphQL using a large language models.
- Created a new benchmark for structural code search, consisting of 400 queries over 10 Java projects, to evaluate the performance of such tools.
- The proposed method significantly outperformed baseline approaches, achieving up to a 57% higher F1 score than embedding-based approaches.

2020 – 2024

📌 **R&D Graduate Student Intern** Sandia National Laboratories.

- Productionized object detection models for next-generation millimeter-wave scanners, resulting in a 6x reduction in inference time and improved precision/recall compared to a baseline model.
- Developed new methods to colorize/visualize hyperspectral CT data by combining dimension reduction (e.g. UMAP and T-SNE) with generalized linear models to improve the interpretability of spectrally similar materials.
- Used Vitis HLS to develop an FPGA implementation of a List-Mode MLEM reconstruction algorithm, achieving a 5x speed-up compared to an equivalent CPU implementation.

2019 – 2020

📌 **DevOps Engineer** Camino Financial

- Created a CI/CD pipeline that increased the deployment rate by 25%.
- Refactored loan system architecture to enable zero-downtime deployments.
- Built a ChatOps solution to streamline and monitor deployments to staging and production environments.
- Introduced changes to the development workflow that reduced unnecessary overhead.

2018 – 2019

📌 **Research Assistant** LEMUR Lab at UCLA

- Extended (Simulation Environment for Cooperative Localization) CoLo Project to incorporate signal strength and communication cost in its analysis and automated data collection for running physical experiments, greatly reducing setup time.

Skills

Languages
Libraries/Frameworks

📌 Python, Go, C, C++, \LaTeX , Bash, Fish

📌 PyTorch, Tensorflow, NumPy, Matplotlib, Pandas