Cody Kinneer

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Education

Institute for Software Research, Carnegie Mellon University — **Pittsburgh, PA**
PhD Software Engineering, Advisors: Claire Le Goues, David Garlan, 4.06/4.33 — *Expected: 2021*

Institute for Software Research, Carnegie Mellon University — **Pittsburgh, PA**
MS in Software Engineering, Advisors: Claire Le Goues, David Garlan — *2018*

Allegheny College — **Meadville, PA**
BS in Computer Science, 3.798/4.000 — *2016*
Minor: Political Science

PhD Thesis

Title: *Search-based Plan Reuse in Self-* Systems*

Description: Self-adaptive systems with large state spaces can evolve in response to unexpected changes by reusing existing plans with stochastic search in the following three ways: (a) reusing existing plans using genetic programming and reuse enhancing approaches to reduce evaluation time, (b) building reusable repertoires by identifying generalizable plan fragments to build resilience against unknown unknowns, and (c) reusing abstract strategies in adversarial settings.

Undergraduate Thesis

Title: *Query-aware Search-based Schema Testing*

Supervisors: Gregory M. Kapfhammer, Robert Roos

Description: Generating test data for relational database queries increases the realism of testing and is a step towards comprehensive testing of database dependent applications.

Publications

Cody Kinneer, Ryan Wagner, Fei Fang, Claire Le Goues, and David Garlan. Modeling observability in adaptive systems to defend against advanced persistent threats. In *Proceedings of the 17th ACM-IEEE International Conference on Formal Methods and Models for Systems Design*, 2019.

Gabriel A. Moreno, Cody Kinneer, Ashutosh Pandey, and David Garlan. Dartsim: an exemplar for evaluation and comparison of self-adaptation approaches for smart cyber-physical systems. In *Proceedings of the 14th International Symposium on Software Engineering for Adaptive and Self-Managing Systems*, pages 181–187. IEEE Press, 2019.

Cody Kinneer and Sebastian J. I. Herzig. Dissimilarity measures for clustering space mission architectures. In *Proceedings of the 21th ACM/IEEE International Conference on Model Driven Engineering Languages and Systems*, pages 392–402. ACM, 2018.

Cody Kinneer, Zack Coker, Jiacheng Wang, David Garlan, and Claire Le Goues. Managing uncertainty in self-adaptive systems with plan reuse and stochastic search. In *Proceedings of the*

13th International Symposium on Software Engineering for Adaptive and Self-Managing Systems, 2018.

Phil McMinn, Chris J. Wright, Cody Kinneer, Colton J. McCurdy, Michael Camara, and Gregory M. Kapfhammer. *SchemaAnalyst*: Search-based test data generation for relational database schemas. In *Proceedings of the 32nd IEEE International Conference on Software Maintenance and Evolution*, 2016.

Cody Kinneer, Gregory M. Kapfhammer, Chris J. Wright, and Phil McMinn. Expose: Inferring worst-case time complexity by automatic empirical study. In *Proceedings of the 27th International Conference on Software Engineering and Knowledge Engineering*, 2015.

Cody Kinneer, Gregory M. Kapfhammer, Chris J. Wright, and Phil McMinn. Automatically evaluating the efficiency of search-based test data generation for relational database schemas. In *Proceedings of the 27th International Conference on Software Engineering and Knowledge Engineering*, 2015.

Experience

Research

Jet Propulsion Laboratory **Pasadena, CA**
Visiting Student Researcher, Sebastian J. I. Herzig *Summer 2017*
Architecture synthesis, design space exploration, and clustering
- Developed techniques for clustering space mission architectures to enable design space exploration.
- Compared human intuition on architectural similarity to results of automated approaches.
- Presented results at an international conference.

Allegheny College **Meadville, PA**
Cupper Scholar *Summer 2015*
Database testing, search-based test data generation, and performance evaluation
- Developed technique for automated empirical analysis of test data generation tools.
- Conducted a large-scale experiment using a high performance computer cluster.
- Presented results at an international conference and gave a technical demonstration during poster session.

University of Colorado Colorado Springs **Colorado Springs, CO**
NSF REU, Kristen Walcott-Justice *Summer 2014*
Mobile application testing and machine learning
- Studied behavior of Android applications and test suites using aspect-oriented programming.
- Evaluated test suite adequacy by probabilistic comparison to user interactions.
- Communicated research by writing reports and delivering presentations.

Teaching

Carnegie Mellon University **Pittsburgh, PA**
Teaching Assistant, Claire Le Goues and Christian Kästner *Fall 2017*
Led weekly recitations, graded assignments, and assisted students during office hours.

ILead PA, Professional Conference **Harrisburg, PA**
Instructor *June 2015,2016*
Taught an interactive two hour class on embedded systems programming projects for libraries.

Allegheny College **Meadville, PA**
Computer Science Tutor *Fall 2014–Spring 2016*
Reinforce lab assignment content to computer science students during weekly drop-in hours.

Allegheny College **Meadville, PA**
Freshman Seminar Teaching Assistant, Howard Tamashiro *Spring 2014*
Assisted transfer students with writing skills and adapting to life at Allegheny College.

Vocational

Meadville Public Library **Meadville, PA**
Information Technology Department *2012–2016*
Design and implement software, analyze data, automate reports
- Integrated Adobe Content Server with library's online catalogue for a statewide ebook hosting project.
  - `http://catalog.paliberty.net/`
- Developed computer-vision gate counters for reporting library visitors.
- Analyzed public Wi-Fi usage of nine public libraries in Crawford County.

Skills

Languages: Experienced: Java, LaTeX, R **Working knowledge**: Python

Software: Git, Eclipse, Vim, Linux, Windows, PRISM

Awards

Best Artifact: Awarded at SEAMS'19 for DARTSim exemplar system.

Best Senior Thesis Prize: Departmental award for writing the best undergraduate thesis.

Outstanding Senior Major: Prize for achievement and contribution to the life of the department.

Certificate of Appreciation: From the PA Department of Education for contributing to ILead.

Alden Scholar: (Dean's List) Fall 2012–Spring 2016.

Outstanding Junior Major: Prize for the computer science junior major with the highest GPA.

Software

ExpOse: Automatically conduct empirical performance evaluations.

- `https://github.com/kinneerc/ExpOse`

cv-counter: Track the number of visitors moving through a doorway using computer vision.

- `https://github.com/kinneerc/cv-counter`