

Zhen Zhang

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Research Interests

Programming Languages • Formal Verification • Program Analysis • Runtime Systems

Education

2013.9 - 2017.7
expected B.ENG. (with Honorary Rank) in Computer Science and Technology
University of Science and Technology of China

2015 fall SEMESTER EXCHANGE PROGRAM
Hong Kong Polytechnic University

Research Experience

- 2016 **Max Planck Institute for Software Systems**, Saarbrücken, Germany
- **Research Intern** at PL/Verification group
 - **Verified** ticket-lock, treiber's stack, and flat-combiner algorithms using *Iris* framework; **Implemented** logically atomic triple and its generic encoding from CaReSL style syncer spec; **Contributed** several bug reports and patches to Iris
 - **Advisor:** Dr. Derek Dreyer (Tenured Faculty of MPI-SWS)
- 2016 **USTC-Yale Joint Research Center for High-Confidence Software**, Hefei, China
- **Proposed** xWIDL, a novel way of detecting API misuses in JavaScript applications by extending WebIDL specification language; **Implemented** the prototype of checker and integrated it with TAJIS analyzer and Dafny verifier.
 - **Advisor:** Prof. Yu Zhang
- 2015 **USTC-Yale Joint Research Center for High-Confidence Software**, Suzhou, China
- **Designed** resource predicates and synthesizing specifications for C standard I/O functions to detect file resource leakage. This feature has been **merged** into *ShapeChecker*, a LLVM IR static analyzer based on *KLEE* symbolic executor.
 - **Advisors:** Dr. Zhaopeng Li, Prof. Xinyu Feng

Publications

- Zhen Zhang. **xWIDL: Modular and Deep JavaScript API Misuses Checking Based on eXtended WebIDL**. In *Companion Proceedings of ACM SPLASH 2016*.

Work Experience

- 2016 **Mozilla Research** (remote), funded by Google Summer of Code 2016
- **Implemented** File API and related support in Servo browser engine; **Modeled** the referencing relationship in File API; **Improved** the W3C File API standard

Student Competitions

- 2016 **Second Place**, ACM SPLASH 16' Student Research Competition (Undergrad track)
- This competition features undergrad/graduate students present their original research at well-known ACM conferences. The student will first submit a two-page **research abstract** to the program committee, then the accepted ones will compete in the next two rounds (**poster** and **presentation**) during the conference.
- 2015 **Third Place**, ISC-HPCAC International Student Cluster Competition
- This competition features 11 invited teams compete in real-time on the ISC exhibit floor to demonstrate the greatest performance across a series of **benchmarks** and **applications** with a **small cluster of their own design**
 - I am responsible for benchmarking two applications (HPCC, PyFR) as well as system building and administration.
- 2014 **Gold Medal**, International Genetically Engineered Machine competition (iGEM)
- This competition features multidisciplinary teams work all summer long to build **genetically engineered systems** using standard biological parts called Biobricks.
 - I am responsible for designing generic circuit, developing mathematical models, and maintaining project wiki website.

Projects

Personal projects include:

- *RuScript*: **a statically checked object-oriented language** with GC runtime and bytecode compiler, designed and implemented by myself in Rust and Haskell.
- *BBQ-SG*: **a static website generator** features dependency analysis and type-safe templates, designed and implemented by myself in Haskell.
- *Hackern*: **a lightweight distributed system** based on unikernel HaLVM, in which I implemented the storage support and shell interface part in Haskell and C.

Open Source contributions include:

- **Servo browser engine**: Implementation of DOM APIs and resource backends
- **HaLVM unikernel**: Integration of the HaLFS file system library

Honors & Scholarships

- 2016 USTC Honorary Rank (top 5% students in the graduation class of the year)
- 2014, 2016 USTC Excellent Student Scholarship
- 2015 USTC Huayu Scholarship
- 2014 - 2016 USTC Computer Science Talent Class Fellowship