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Sankha Narayan Guria

Education

University of Maryland, College Park, MD
Ph.D. in Computer Science. **GPA:** 3.79/4.0 *Aug' 17 - Present*
Advisors: Prof. Jeff Foster and Prof. David Van Horn

Indian Institute of Technology Jodhpur, India
B.Tech. in System Science. **GPA:** 8.26/10.0 *Jul' 11 - Jul' 15*

Publications

- M. Kazerounian, **S. N. Guria**, N. Vazou, J. Foster, D. Van Horn. "Type-Level Computations for Ruby Libraries". *In review*
- M. Keil, **S. N. Guria**, A. Schlegel, M. Geffken, P. Thiemann. "Transparent Object Proxies in JavaScript". *29th European Conference on Object-Oriented Programming (ECOOP) 2015*

Awards & Achievements

- Dean's Fellowship, University of Maryland, $5000 for 2017-2018
- Summer Dean's Fellowship, University of Maryland, $5000 for Summer 2018

Experience

University of Maryland
Graduate Research Assistant *Jun '18 - Present*

- Developing practical type systems and verification tools for Ruby programs, based on RDL.
- Wrote type definitions for the Ruby standard library and database query DSLs (ActiveRecord and Sequel) that helps to type check large scale Ruby on Rails web applications.

BrowserStack
Software Engineer *Jun '15 - Jun '17*

- One of the two primary developers to build and release *App Live* - the interactive cloud based mobile app testing on real devices product from scratch in 5 months.
- Scaled the *Automate* product to more than 300,000 sessions/day (~4x growth), changed the engineering culture of the team to rely on automated test suites to ship faster at 99.5% stability.
- Established organization-wide instrumentation for the cloud infrastructure, built real-time message relay service, optimized real device cloud to achieve ~2x faster user perceived session start-time.

University of Freiburg
Research Intern, Advisor: Prof. Peter Thiemann *May '14 - Jul '14*

- Developed JavaScript language semantics with transparent proxies against the equality operator and defined an object capability model for security related use cases in contract systems.
- Propositions were implemented on SpiderMonkey VM's interpreter and baseline JIT and proved to run with real-world benchmarks without any performance regressions.

Mozilla
Open-source Contributor *Jun '12 - Jul '14*

- Primarily contributed to SpiderMonkey - the JavaScript engine. Shipped new ECMAScript 6 features like Array, Map & Set iteration methods, String#repeat, Object.setPrototypeOf, etc.
- Implemented a number of JIT optimizations, async I/O in critical paths to reduce browser jank.
- Proposed and implemented a deterministic algorithm to analyze the browsing and form submission behavior of the user to detect search forms as a part of *Google Summer of Code 2013*.

Projects

Automated Verification of Database Model Validations
Advisor: Prof. Jeff Foster *Oct '17 - Dec '17*

- Developed a framework to compile database model schema and related methods in Ruby on Rails applications to an equivalent Rosette program, emulating basic database queries with Rosette structs.
- Verified database validation predicates hold statically, by discharging them as SMT queries to Z3.

Specializing JavaScript Programs
Advisor: Prof. Peter Thiemann *Feb '14 - May '14*

Studied program specialization techniques for JavaScript interpreters. Results were added to a JavaScript interpreter written in JS, to type specialize operations by gathering type feedback to make them faster.