

# Sankha Narayan Guria

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| EDUCATION | <b>University of Maryland</b> , College Park, MD<br>Ph.D. in Computer Science.<br><i>Advisors: Prof. Jeff Foster and Prof. David Van Horn</i> | <i>Aug' 17 - Present</i> |
|           | <b>Indian Institute of Technology Jodhpur</b> , India<br>B.Tech. in System Science.   | <i>Jul' 11 - Jul' 15</i> |

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| PUBLICATIONS | <b>Type-Level Computations for Ruby Libraries</b><br>M. Kazerounian, S. N. Guria, N. Vazou, J. Foster, D. Van Horn. PLDI 2019.<br><b>Transparent Object Proxies in JavaScript</b><br>M. Keil, S. N. Guria, A. Schlegel, M. Geffken, P. Thiemann. ECOOP 2015. |  |
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| AWARDS & ACHIEVEMENTS | - <b>Dean's Fellowship:</b> \$5000, University of Maryland<br>- <b>Summer Dean's Fellowship:</b> \$5000, University of Maryland<br>- <b>NSF Travel Award:</b> \$700, Summer School on Formal Techniques, SRI | <i>2017-2018</i><br><i>Summer 2018</i><br><i>May 2018</i> |
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| EXPERIENCE | <b>University of Maryland</b><br><i>Graduate Student Researcher</i><br>- Developing practical type systems and verification tools for Ruby programs, based on <a href="#">RDL</a> .<br>- 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.<br><br><b>Synthetic Minds</b><br><i>Research Intern</i><br>- Helped with the design and implementation of a symbolic execution engine for Solidity. It supports variety of solver aided queries like verification, angelic execution and synthesis of adversary contracts.<br>- Scaled the system to run on large smart contracts like <a href="#">Augur</a> , without any programmer annotations<br>- verifying properties from their test suite.<br><br><b>BrowserStack</b><br><i>Software Engineer</i><br>- One of the two primary developers to build and release <i>App Live</i> - the interactive cloud based mobile app testing on real devices product from scratch in 5 months.<br>- Scaled the <i>Automate</i> 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.<br>- 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.<br><br><b>University of Freiburg</b><br><i>Research Intern, Advisor: Prof. Peter Thiemann</i><br>- 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.<br>- Propositions were implemented on SpiderMonkey VM's interpreter and baseline JIT and proved to run with real-world benchmarks without any performance regressions.<br><br><b>Mozilla</b><br><i>Open-source Contributor</i><br>- Primarily contributed to SpiderMonkey - the JavaScript engine. Shipped new ECMAScript 6 features like Array, Map & Set iteration methods, String#repeat, Object.setPrototypeOf, etc.<br>- Implemented a number of JIT optimizations, async I/O in critical paths to reduce browser junk.<br>- 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 <i>Google Summer of Code 2013</i> . | <i>Jun '18 - Present</i><br><i>May '19 - Aug '19</i><br><i>Jun '15 - Jun '17</i><br><i>May '14 - Jul '14</i><br><i>Jun '12 - Jul '14</i> |
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| PROJECTS | <p><b>Automated Verification of Database Model Validations</b><br/> <i>Advisor: Prof. Jeff Foster</i> <span style="float: right;"><i>Oct '17 - Dec '17</i></span></p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- Verified database validation predicates hold statically, by discharging them as SMT queries to Z3.</li> </ul> <p><b>Specializing JavaScript Programs</b><br/> <i>Advisor: Prof. Peter Thiemann</i> <span style="float: right;"><i>Feb '14 - May '14</i></span></p> <p>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.</p> |
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| TECHNICAL SKILLS | <p><b>Languages:</b> Ruby, JavaScript, C, C++, Python, Bash, Racket<br/> <b>SAT/SMT Solvers:</b> Z3<br/> <b>Research Tools:</b> Coq, Rosette</p> |
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| TEACHING EXPERIENCE | <p><b>CMSC430:</b> Introduction to Compilers <span style="float: right;"><i>Fall 2019</i></span><br/> <i>Teaching Assistant</i></p> <p><b>CMSC433:</b> Programming Language Technologies and Paradigms <span style="float: right;"><i>Spring 2018</i></span><br/> <i>Teaching Assistant</i></p> <p><b>CMSC216:</b> Introduction to Systems <span style="float: right;"><i>Fall 2017</i></span><br/> <i>Teaching Assistant</i></p> |
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