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Programming Languages and Verification Seminar

MemInsight: Platform-Independent Memory Profiling for JavaScript

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ECCR 116
Wednesday, December 3, 2014
4:00 p.m. to 5:00 p.m.

JavaScript programs tend to suffer from memory issues that can either hurt performance, or worse, make programs crash due to slow exhaustion of memory. We present a new memory profiling tool MemInsight for JavaScript applications, including web applications. MemInsight is platform independent: it employs source-code instrumentation to generate a trace of memory allocations and accesses, and it uses standard browser features to track precise information for DOM (document object model) objects. The information thus collected enables detailed, time-varying analysis of memory behavior, including that of DOM objects.

We describe several client analyses built into MemInsight. For instance, it points out situations in which there may be a memory leak, and it reports opportunities for replacing dynamic allocation with stack allocation. MemInsight is extensible to custom analyses as well. Our experimental evaluation showed that our client analyses found interesting memory issues in several publicly available apps, and that MemInsight had reasonable overhead.

Manu Sridharan is a researcher at Samsung Research America in the area of programming languages and software engineering. He received his PhD from the University of California, Berkeley in 2007. His dissertation focused on refinement-based program analysis tools. Since then, he has done research on a variety of topics in static analysis, dynamic analysis, and software engineering. He worked at IBM Research from 2008–2013. For further details, see http://manu.sridharan.net.

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