EE382V: Project Proposal

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Abstract—In this project, we want to focus on the trace profiling and possible optimization to the existing JIT JavaScript engines, such as IonMonkey and V8. By applying the optimization techniques we have learned in class, we want to study how modern browsers dynamically compile JavaScript, and to see if we can come up with a feasible idea to make some enhancements.

I. INTRODUCTION

As the popularity of web-based applications and services increases, browser performance has become one of the major competitions in the industry. Since JavaScript is what makes modern web pages dynamic and interactive, how to optimize its compilation/interpretation is the key component to building fast and robust modern browsers. Apart from its essential role in client-side interactions, JavaScript also became one of the mainstream server-side solutions in recent years [3].

Although JavaScript is traditionally translated into bytecode by an interpreter, more and more JavaScript Engines in modern browsers are designed to compile directly into machine code. Our project will mainly focus on trace profiling [1] in IonMonkey and V8, and make constructive adjustments according to the optimization techniques we have learned in class. We will use the SunSpider JavaScript Benchmark to measure and compare the existing infrastructure with our proposed optimizations, and make a sound analysis of the results. If time permitting, we will also look into JavaScript Engine solutions on mobile devices. Our overall goal is to understand the common optimization procedures performed by modern JavaScript Engines, as well as the possible performance enhancements with the knowledge we've acquired from EE382V.

REFERENCES

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[3] "Why Everyone Is Talking About Node." Jolie O'Dell. Mashable, Inc., Web. 10 Mar. 2011.