

CMPSC 263/CS190C :: Runtime Systems

UCSB Computer Science

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<http://www.cs.ucsb.edu/~cs263>

Announcements

- Grades (over time) will be [available here](#)
- Welcome to the CS263/CS190C web site
- [Course schedule/lectures](#) posted

Course Description

The material I present in this course is an introduction to modern implementations of programming language features. We will focus on languages that execute via managed runtime systems (i.e., garbage collected and dynamically interpreted/compiled languages) for high-level languages (e.g. Java, Python, Javascript), including their similarities and differences. In addition, we will investigate the the inner workings of the interpreter and just-in-time/dynamic compiler and how they can use information about the running program to optimize its execution.

Syllabus

- **Class participation, homeworks, quizzes 50%**
Read the assigned papers, ask questions, respond to questions, participate in the discussion, perform well on assignments
May also include presentation of research papers on related topics as part of class discussion (graduate version)
- **Class project or area survey 50%**
Group size: 1-2
[Project Milestones and Ideas](#)
May also include presentation of project at end of class
Projects only required for graduate version of the class

[Class topics and material](#)

Evolution of runtime systems for high-level languages (how we got here)

Structure and layout of the Java bytecode classfile format (code and symbollic data), i.e. the Java Language and Virtual Machine specification

Bytecode verification (+ type-safety checking at load time) *if time*
Garbage collection (fundamentals and advanced extensions)
Interpretation and interpreter optimization (+python runtime)
Dynamic/Just-in-Time and adaptive compilation
Program performance profiling
Trace compilation (+javascript runtimes)
Cross-language interoperation *if time*

Administrivia

Class Times

Monday/Wednesday 9-11:50am, Phelps 2510

Instructor:

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Office: Department of Computer Science, 2153 HFH

Office Hours by appointment

chat, skype on-demand (ckrintz)

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