6.894 OODL Design and Implementation Spring 2001

Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science

Outline (tentative!)

Week 1 (2/6,2/8)

(2/6) **Administration** (GS, JB)

(2/6) **Introduction, Jonathan's view.** (JB)

(2/8) **Introduction, Greg's view.** (GS)

Week 2 (2/13,2/15)

(2/13) **Interpreters and VM's.** (JB, GS)
- Source
- CPS
- Pretreated
- Instruction decode loop
- Threaded VM's
- Cached instructions
- AST-based
- VVM'S

(2/15) **Objects and Types** (GS)
- Simple types
- Record types, recursive types, self types
- Adding subtyping
- Typechecking

Week 3 (2/20,2/22)

Tuesday, 2/20, is a Monday class schedule, so our class will not meet. However, the *New England Programming Languages Seminar* (www.nepls.org) will be meeting at Boston University on Tues., 2/20, and students are encouraged to attend if possible.

(2/22) **Introduction, Kostas's view.** (KA)

(2/22) **Multiple Dispatch, Predicate Types, Predicate Dispatch** (GS)

Week 4 (2/27,3/1)

(2/27) **Paper Presentations** (students)

(3/1) **Runtime Object Systems** (JB)
- Calling conventions
- Tagging
- Fast instance?
- Dispatch
- Redefinition

Week 5 (3/6, 3/8)

(3/6) **Runtime Object Systems, cont'd.** (JB)

(3/8) **Reflection** (GS)
- Meta-object protocols (MOPs)
- Reflective interpreters

Week 6 (3/13,3/15)

(3/13) **Memory Management** (JB or guest)
- Basic GC
- Generational
- Incremental
- Conservative

(3/15) **Intro. to Athena** (KA)

Week 7 (3/20,3/22)

(3/20) **Panel - Runtime** (distinguished guests)

(3/22) **Using Athena (Type Inference Ex.)** (KA)

Week 8 (3/27,3/29)

(3/27,29) **Spring Vacation** ()

Week 9 (4/3,4/5)

(4/3) **Using Athena (Type Inference, Cont'd)** (KA)

(4/5) **Partial Evaluation** (GS)
- Online
- Offline
- Runtime
- Dynamic
- Explicitly staged compilation

Week 10 (4/10,4/12)

(4/10) **Macros** (JB)
- Macro calls
- Macro expansion
- Hygiene
- Macro systems
- Macros for conventional syntax

(4/12) **OO Optimization** (JB)
- Code splitting
- Specialization
- Dispatch
- Inlining

Week 11 (4/17,4/19)

(4/17) **No class (Patriots Day)** ()

(4/19) **Paper Presentations** (students)

Week 12 (4/24,4/26)

(4/24) **Panel - Compilation** (distinguished guests)

(4/26) **OO Optimization, cont'd** (JB)

Week 13 (5/1,5/3)

(5/1) **Proof-Based Compilation** (KA)
- Credible compilation
- Compilation as side effect of proof

(5/3) **Dynamic Compilation** (GS, JB)
- Link-time
- Load-time
- Profile guided

Week 14 (5/8,5/10)

(5/8) **Type Inference for OO** (GS)

(5/10) **Panel - Language Design** (distinguished guests)

Week 15 (5/15,5/17)

(5/15) **Practical Aspects** (JB)
- Compilation to-c
- Bootstrapping
- Basic
- Redef
- Compilation model
- FFI model

(5/17) **Interoperability** (JB)