To: Graduate Students, Faculty, and Staff
From: Gary T. Leavens (294-1580, leavens@cs.iastate.edu)
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Seminar on Continuation Passing Style

Com S 610, Section GL, Spring 1997

The participants will discuss issues and techniques for advanced programming language implementations that use continuations. At the heart of the seminar is understanding and implementing continuations and systematically deriving compilers from interpreters written in continuation passing style (CPS). Continuations are a general form of control structure, and can be used to implement control structures, such as backtracking, exceptions, multilevel breaks, jumps, etc. We will use as a reference chapters 8, 9, 10, and 12 of the text *Essentials of Programming Languages* by Friedman, Wand, and Haynes (the current Com S 342 text), and other papers.

Students will have sufficient background for this seminar if they have had either Com S 342 or Com S 541 (or experience with functional programming).

Objectives for this seminar will be the following, subject to modification by the participants. Participants will be able to:

1. understand continuations, how to use them, how to reason about them, and how to implement interpreters that provide them,

2. systematically derive compilers from interpreters written in CPS.

The seminar will start with an introduction to Scheme and continuations from the text and other sources. We will briefly explore the connection between continuations and monads. We will then proceed through the text at a moderate pace.

Time permitting, we will also use these techniques to investigate advanced multimethod programming languages and type systems for such languages. Such languages are object-oriented languages that allow dynamic dispatch on more than one argument; examples include Dylan and CLOS.

We will have one two-hour meetings, once a week, on Tuesdays at 7pm in 100 Pearson Hall. Students who enroll for credit will be expected to do some exercises or projects to aid their learning. Interested students should contact Gary Leavens (leavens@cs.iastate.edu) and register for course Com S 610, section GL.