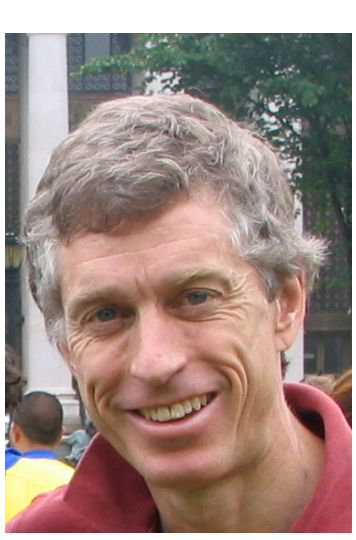
isr PRESENTS

Tucker Taft

"ParaSail: A Pointer-Free Path to Object-Oriented Parallel Programming"



S. Tucker Taft is Director of Language Research at AdaCore, a company focused on providing open-source tools for the design, development, testing, and certification of high-integrity software. Tucker was the lead designer of Ada 95, and was deeply involved in the 2005 and 2012 revisions of the Ada standard. In 2002, Tucker founded SofCheck, which developed advanced static analysis technology now incorporated into AdaCore's CodePeer product line.
Since September 2009, Tucker has been developing the ParaSail language, and has documented its design through a public blog at:

http://parasail-programming-language.blogspot.com

Pointers are ubiquitous in modern object-oriented programming languages, and many data structures such as trees, lists, graphs, hash tables, etc. depend on them heavily. Unfortunately, as is well known, pointers can add significant complexity to programming. Pointers can make storage management more complex, pointers can make assignment and equality semantics more complex, pointers can increase the ways two different names/access-paths can designate the same object, pointers can make program analysis and proof more complex, and finally, pointers can make it harder to "divide and conquer" a data structure for parallel processing.

Is there an alternative to using pointers? ParaSail (Parallel Specification and Implementation Language), a new parallel object-oriented programming language, adopts a different paradigm for defining data structures. Rather than using pointers, ParaSail supports flexible data structuring using "expandable" (and shrinkable) objects, along with generalized indexing. By eliminating pointer and instead basing the language on mutable value semantics, ParaSail reduces the complexity for the programmer, while also allowing ParaSail to provide pervasive, safe, object-oriented parallel programming.

Wednesday, October 17, 2012
10:00 am to 1:00 am
8102 Gates Hillman Center

Contact Victoria Poprocky, poprocky@cs.cmu.edu, to meet with the speaker.

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