

# DISTINGUISHED LECTURER SERIES

T H E I N S T I T U T E F O R S Y S T E M S R E S E A R C H



Tuesday, April 12, 5:00 p.m.

## The Operational Semantics of Hybrid Systems

Edward A. Lee

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Hybrid systems mix continuous and discrete subsystems. In this talk, I will discuss an interpretation of hybrid systems as executable models. A specification of a hybrid system for this purpose can be viewed as a program in a domain-specific programming language. The semantic properties of that programming language have considerable bearing on the understandability, executability, and analyzability of a model. I will discuss several semantic issues that come up when attempting to define such a programming language, including the interpretation of discontinuities in continuous-time signals, the interpretation of discrete-event signals, event detection, and compositionality. I will describe the semantics of HyVisual, which is a domain-specific hybrid systems programming language built using the actor-oriented software framework Ptolemy II.

### Biography

Edward A. Lee is a professor in the Electrical Engineering and Computer Science Department at U.C. Berkeley. His research interests center on design, modeling, and simulation of embedded, real-time computational systems. He is a director of CHES, the Berkeley Center for Hybrid and Embedded Software Systems, and is the director of the Berkeley Ptolemy project. He is co-author of five books and numerous papers. His bachelor's degree (B.S.) is from Yale University (1979), his master's (S.M.) from MIT (1981), and his Ph.D. from U. C. Berkeley (1986). From 1979 to 1982 he was a member of technical staff at Bell Laboratories in Holmdel, N.J., in the Advanced Data Communications Laboratory. He is a co-founder of BDTI, Inc., where he is currently a Senior Technical Advisor, and has consulted for a number of other companies. He is a Fellow of the IEEE, was an NSF Presidential Young Investigator, and won the 1997 Frederick Emmons Terman Award for Engineering Education.

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### Date and time

*Lecture*  
April 12, 5:00 p.m.  
1115 Computer Science  
Instructional Center (CSIC)

*Roundtable discussion*  
April 12, 2:00 p.m.  
2168 A.V. Williams Building

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