My Background

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I am an electrical engineering graduate student at U.C. Berkeley in my fifth year of study. I received my B.S.E.E. cum laude from Washington University in St. Louis in 2001 and my M.S.E.E. from U.C. Berkeley in 2003.

For my Master's work, I designed control algorithms to prevent aircraft from flying into restricted airspace, in a 9/11 inspired security project. This had been joint work under Prof. Edward Lee and Prof. Shankar Sastry. In working on these algorithms, I had my first exposure to multi-paradigm programming in using Ptolemy II and Simulink to experiment with system design via hybrid system modeling.

As a student in Prof. Lee's group, I eventually caught the software bug. The topology I learned working on this control problem prepared me to work on a particular semantics problems in timed systems. In this regard, I generalized Banach's fixed point theorem to show a more general class of systems than the standard *delta causal* systems have well-defined non-Zeno behavior [1]. On this project, I worked closely with Xiaojun Liu, Eleftherios Matsikoudis, and Haiyang Zheng.

Most recently, I have been trying to make it easier to describe huge networks of interconnected components by developing a *composition langauge*. In this language, we want programmers to be able to describe huge configurations, or hierarchical networks of interconnected components, with small amounts of code, via higher-order parameters. This complements work on multi-paradigm systems and metamodeling, which help manage semantic complexity, by managing the syntactic complexity inherent in large systems. I will describe this work in more detail in my position statement. I've been working closely with Thomas Feng and Elaine Cheong on this project.

References

[1] X. L. E. D. M. James Adam Cataldo, Edward A. Lee and H. Zheng. A constructive fixed-point theorem and the feedback semantics of timed systems. (accepted wodes 2006.). Technical Report UCB/EECS-2006-4, EECS Department, University of California, Berkeley, January 24 2006.