



Course Announcement

The Department of Electrical and Computer Engineering Santa Clara University



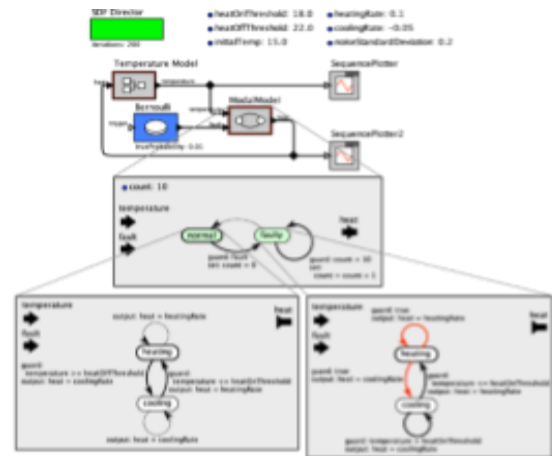
ELEN 503: Hardware-Software Co-Design

Dr. Hoeseok Yang

Spring 2022

Class Time: Th 5:10 – 7:00 pm

COURSE DESCRIPTION: HW/SW co-design of embedded or cyber-physical systems, system modeling and simulation using *Ptolemy II*, Electronic System Level (ESL) design with *SystemC*, and Optimization techniques for HW/SW co-design (integer linear programming and evolutionary algorithms).



A system modeling example in Ptolemy II

BACKGROUND INFORMATION:

Today's computer systems are ubiquitous, integrated into many devices or infrastructures that we interact with. Examples of these embedded or cyber-physical systems include smart grid, autonomous vehicles, industrial control/robotics systems, and so on. In such systems, physical and software components are deeply intertwined and interact with each other in various ways. However, due to exponentially growing complexities and tight design constraints, traditional design approaches are no longer feasible, demanding novel, well-defined and formal methods for programming and design of complete systems across HW/SW boundaries or various abstraction levels.

This course covers principles and practices of HW/SW co-design: specification/modeling, HW/SW partitioning, HW/SW co-simulation/co-verification, and HW/SW co-synthesis. Starting from the formal modeling foundations that enable design automation, the course will cover state-of-the-art performance estimation, simulation, optimization, and verification methods and techniques at the system level with various case studies.

