Announcing the Final Examination of Arya Pournabatabaie for the degree of Master of Science

Time & Location: November 3, 2016 at 12:00 PM in HEC 450
Title: Verification and Automated Synthesis of Memristor Crossbars

The Memristor is a newly synthesized circuit element correlating differences in electrical charge and magnetic flux, which effectively acts as a nonlinear resistor with memory. The small size of this element and its potential for passive state preservation has opened great opportunities for data-level parallel computation, since the functions of memory and processing can be realized on the same physical device.

In this research we present an in-depth study of memristor crossbars for combinational and sequential logic. We outline the structure of formulas which they are able to produce and henceforth the inherent powers and limitations of Memristive Crossbar Computing.

As an improvement on previous methods of automated crossbar synthesis, a method for symbolically verifying crossbars is proposed, proven and analysed. The same method is then used as a fitness function in the context of a genetic algorithm for automated synthesis of crossbars.

Major: Computer Science

Educational Career:
Bachelor's of Electrical Engineering, BS, 2014, University of Tehran

Committee in Charge:
Sumit Jha, Chair, Computer Science
Mainak Chatterjee, Computer Science
Gary Leavens, Computer Science

Approved for distribution by Sumit Jha, Committee Chair, on October 8, 2016.

The public is welcome to attend.