The development of algorithms and circuit designs that exploit devices that have the ability to persist multiple values will lead to alternative technologies to overcome the issues caused by the end of Dennard scaling and slowing of Moore's Law. Flow-based designs have been used to develop binary adders and multipliers. Data stored on non-volatile memristors are used to direct the flow of current through nanowires arranged in a crossbar. The algorithmic design of the flow-based crossbar is fast, compact, and efficient. This dissertation makes contributions to automating the discovery of flow-based designs of ternary circuits utilizing memristive crossbars.

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The public is welcome to attend.