

Robust System Design: Overcoming Complexity and Reliability Challenges

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Today's mainstream electronic systems typically assume that transistors and interconnects operate correctly over their useful lifetime. With enormous complexity and significantly increased vulnerability to failures compared to the past, future system designs cannot rely on such assumptions. At the same time, there is explosive growth in our dependency on such systems. Robust system design is essential to ensure that future systems perform correctly despite rising complexity and increasing disturbances.

This talk will address the following major robust system design goals:

1. New approaches to thorough test and validation that scale with tremendous growth in complexity; and,
2. Cost-effective tolerance and prediction of failures in hardware during system operation.

Significant recent progress in robust system design impacts almost every aspect of future systems, from ultra-large-scale networked systems, all the way to their nanoscale components.