IEEE's Orange County Solid-State Circuits Society (SSCS)
Present:

The Quantum Advantage: Computing with Nature's Weirdness

By Professor Nader Bagherzadeh, University of California, Irvine.

Day: Monday, October 27th, 2025

Time:

Registration & Networking	5:30 P.M. – 6:30 P.M.
Presentation (Dr. Bagherzadeh)	6:30 P.M. – 7:30 P.M.
Q&A	7:30 P.M. – 8:00 P.M.

Address & Parking:
Knobbe Martens Building, 2040 Main St., Irvine 92614
First Floor Conference Room.
Parking validation will be provided for all attendees.

Fee: Free and open to all Quantum Computing enthusiasts.
Registration: **https://events.vtools.ieee.org/event/register/500508**

Send questions to Farhad Mafie, IEEE-OC SSCS Chair: FarhadMafie@Gmail.com

Abstract: In this talk, I will introduce the difference between classical bits (0/1) and qubits, which draw power from superposition and entanglement. I will explain, in plain terms, how superposition encodes many possibilities at once and how entanglement creates correlations no classical system can mimic, enabling quantum algorithms to traverse multiple solution paths more efficiently than step-by-step search. I will also discuss the engineering realities: quantum states are fragile, subject to decoherence and operational noise, so today's devices have short coherence times and nontrivial error rates. Finally, I will discuss the state of the art in quantum computers from major players—Google, IBM, and leading startups—highlighting their architecture, capabilities, and near-term roadmaps.

Dr. Nader Bagherzadeh has been involved in research and development in the areas of computer architecture, reconfigurable computing, VLSI chip design, and computer graphics. For almost ten years ago, he was the first researcher working on the VLSI design of a Very Long Instruction Word (VLIW) processor. Since then, he has been working on multithreaded superscalars and their application to signal processing and general-purpose computing. His current project at UC, Irvine, is concerned with the design of coarse grain reconfigurable pixel processors for video applications. The proposed architecture, called MorphoSys, is versatile enough to be used for digital signal processing tasks such as the ones encountered in wireless communications and sonar processing. DARPA and NSF fund the MorphoSys project (total support $1.5 million). Dr. Bagherzadeh was the Chair of Department of Electrical and Computer Engineering in the Henry Samueli School of Engineering at University of California, Irvine. Before joining UC, Irvine, from 1979 to 1984, he was a member of the technical staff (MTS) at AT&T Bell Laboratories, developing the hardware and software components of the next-generation digital switching systems (5 ESS). Dr. Bagherzadeh holds a Ph.D. in computer engineering from The University of Texas at Austin. As a professor, he has published more than a hundred articles in peer-reviewed journals and conference papers in areas such as advanced computer architecture, system software techniques, and high-performance algorithms. He has trained hundreds of students who have assumed key positions in software and computer systems design companies in the past twelve years.

SPECIAL THANKS TO Knobbe Martens **FOR SPONSORING & HOSTING THIS EVENT!**

Please share this flyer with your network and help us promote IEEE SSCS activities in Orange County.
Your support in spreading the word is greatly appreciated!