FEBRUARY 2023

CONNECTIONS LATEST NEWS AND UPDATES FROM SEMICONDUCTOR RESEARCH CORPORATION

Get to Know the 7 New JUMP 2.0 Research Centers

SRC's joint effort with DARPA was officially announced on January 4, 2023. Learn more.

COCOSYS
Center for the Co-Design of Cognitive Systems, Georgia Tech
Center Director = Prof. Arijit Raychowdhury
Read More

CUbiC
Center for Ubiquitous Connectivity, Columbia
Center Director = Prof. Keren Bergman
Read More

ACE
Evolvable Computing for Next Generation Distributed Computer Systems, U. of Illinois
Center Director = Prof. Josep Torrellas
Read More

CogniSense
Center on Cognitive Multispectral Sensors, Georgia Tech
Center Director = Prof. Saibal Mukhopadhyay
Read More

PRISM Center for Processing with Intelligent Storage and Memory, UCSD
Center Director = Prof. Tajana Rosing
Read More

CHIMES Center for Heterogeneous Integration of Micro Electronic Systems, Penn State
Center Director = Prof. Madhavan Swaminathan
Read More

SUPREME SUPeRior Energy-efficient Materials and dEvices, Cornell University
Center Director = Prof. Huili (Grace) Xing
Read More

Early last month, we proudly announced the launch of seven university research centers that share the same goal for JUMP 2.0: "to significantly improve performance, efficiency, and capabilities across a range of electronics systems."

"We are at an inflection point in the evolution of computing systems and technologies," said Roman Caudillo, the JUMP 2.0 Director. "The JUMP 2.0 program will be a key component in identifying and forging the best path forward by driving public-private investment for disruptive innovation in microelectronics systems at scale. I look forward to helping guide the semiconductor industry through the SRC JUMP 2.0 program and in cooperation with DARPA in the years to come."

With these seven centers, we strive to engage all member liaisons and maximize value for all stakeholders.

Semiconductor Research Corporation

Jing Li Elevated to ACM Distinguished Member


image credit: Univ. of Pennsylvania

CRISP PI **Jing Li**, Associste Professor at the University of Pennsylvania, was elevated to ACM Distinguished Member. This member grade is awarded for “outstanding scientific contributions to computing."
Prof. Li is a researcher on three JUMP CRISP Center tasks. Continue reading.

Moin Qureshi Elevated to IEEE Fellow and ACM Fellow

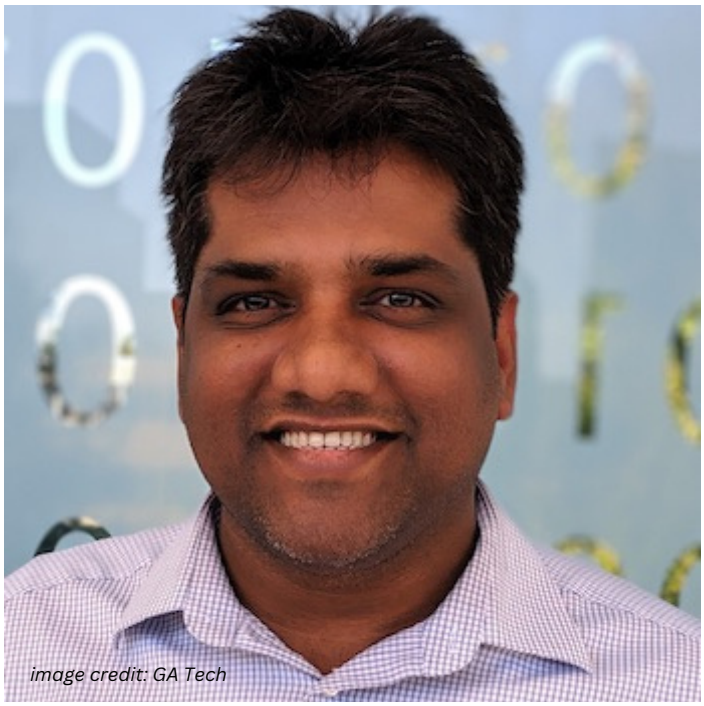


image credit: GA Tech

CRISP PI, **Moinuddin Qureshi**, Professor at Georgia Tech, was elevated to IEEE Fellow for his contributions to scalable memory systems. He was also just elevated to ACM Fellow. Prof. Qureshi is a researcher in the JUMP CRISP Center. Continue reading.


image credit: Univ. of Florida

Prabhat Mishra Elevated to AAAS Fellow

Professor **Prabhat Mishra** of the University of Florida has been elevated to the rank of American Association for the Advancement of Science (AAAS) Fellow. He is being honored for distinguished contributions to the field of reliable and trustworthy systems design, particularly developing scalable and automated techniques for energy-aware computing, system-on-chip verification, and hardware security validation.

Continue reading.

Democratizing Domain-Specific Computing

image credit: Bclass

In this article, supported in part by CRISP, one of six centers in JUMP, Professor **Yuze Chi** *(et al.)* of UCLA highlights the research on democratizing customized computing by providing highly effective compilation tools for creating customized DSAs on FPGAs. This is a critical step toward the democratization of customized computing.

Read the full publication here.

WATCH Professor **Jason Cong**'s (UCLA) keynote speech at ICCAD 2022.

The World's First DNA Storage Machine is the Size of a Bus

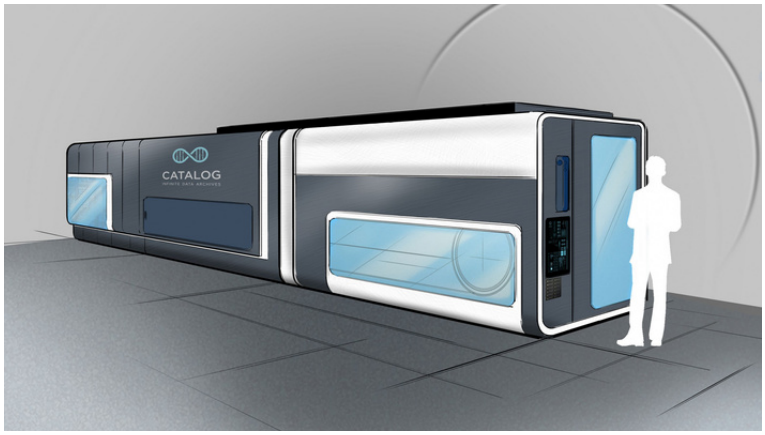


image credit: 311Institute.com

Catalog, a machine that could one day convert movies or data archives into invisible pellets of DNA, has been secretive about its approach, leading other scientists to say they can't judge whether it makes sense. Our very own **Victor Zhirnov,** who is tracking developments in DNA storage, says the firm's "library" idea is economically viable, in theory. "By doing this they don't need to synthesize new DNA for every new piece of information to store, instead they just have to remix their prefabricated DNA," he adds.

Read more.

Spotlight on CRISP

CRISP
Center for Research in Intelligent Storage and Processing in Memory

Top left: Prof. Kevin Skadron, CRISP director
Top right: Prof. Samira Khan
Left: Prof. Mircea Stan

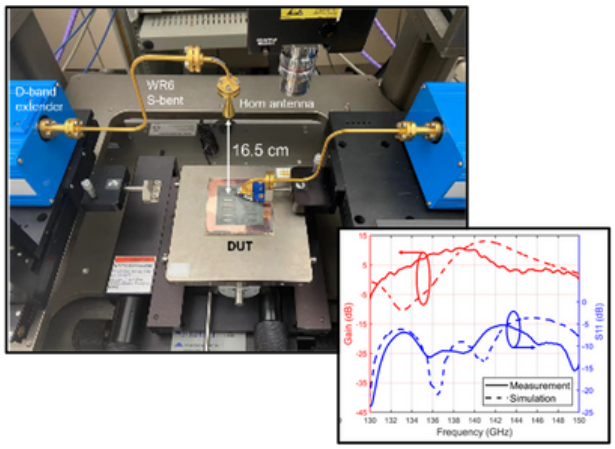
image credit: UVA

Since 2017, UVA's researchers have completed five years of groundbreaking work that will revolutionize scientists' ability to apply data. Faster analysis of massive datasets exponentially accelerates discovery of solutions to the worlds' most vexing problems. For example, rapidly accumulating patient data around bioinformatics holds the key to quickly pinpoint more effective treatments. But access to the data is not enough. Analyzing it requires computer processing speeds never imagined. "Our recent results show that we can speed up sequence alignment from 20 hours to less than a second, and we believe that further speedups of 100 times or more are possible with the new architectures center researchers are developing," said Professor **Tajana Rosing**, UC-San Diego. Read more.

Tech Transfer Series

World's 1st Embedded Die with D-Band Integrated Antenna in a Glass Interposer Transferred to SHIP

Motivated by JUMP cross-Center collaborations between ComSenTer and ASCENT, a Georgia Tech team led by Prof. **Madhavan Swaminathan** (2776.034, .035, .036, and .077) has developed a glass interposer with embedded dies for use in the D-Band (110–170 GHz). The demonstrator included the use of dry polymer films, has substrate integrated waveguides (SIW), an Antenna in Package (AiP), integrated passives, and embedded actives, and is supported by back side cooling. The team, which includes several outstanding SRC Scholars, also performed a thermal management study. This research demonstration has graduated to the next level as the technology was selected to be part of Qorvo's RF Packaging program, SHIP (State-of-the-Art Heterogeneous Integrated Packaging), supported by NSWC Crane. Great job, Yellow Jackets!



2023 GOALS

Semiconductor Research Corporation

Deliver MAPT roadmap and align SRC Research Portfolio to **capture public-private partnership funding** that fuels member-relevant SRC R&D and workforce initiatives

Create new and meaningful **technology transfer** and promote awareness within member companies

Successfully launch JUMP 2.0 Centers that **engage member liaisons** and maximize value for all stakeholders

Provide and adopt tools that **improve SRC Stakeholder experience** by making it easy to get involved, contribute, and deliver and derive insight quickly

Focus on **workforce development** to generate more member hires of SRC research scholars, to enhance scholar programs, and to progress Broadening Participation pledge