

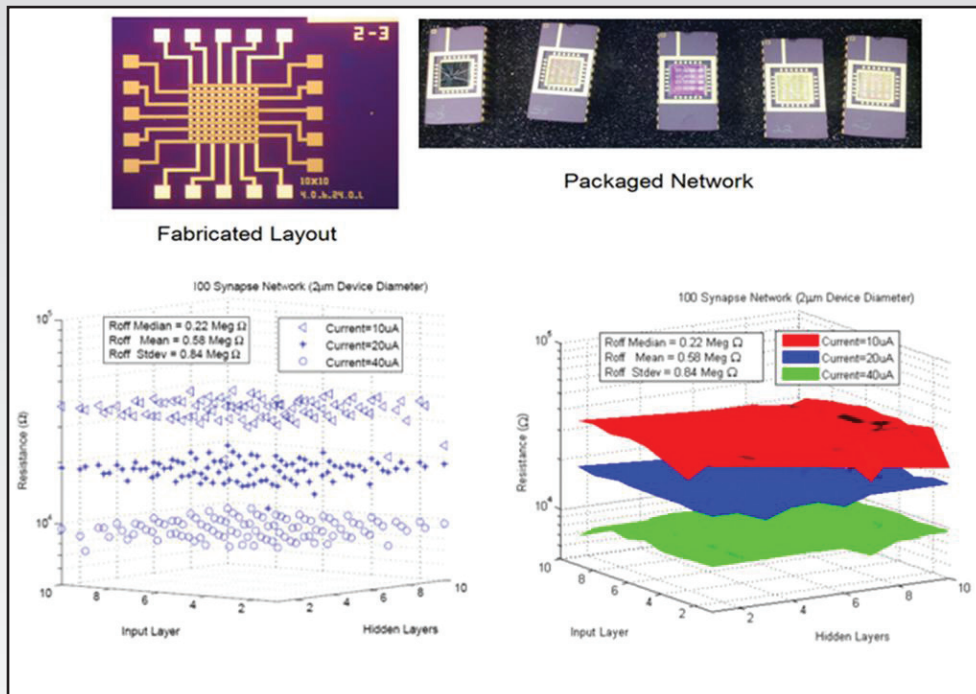
## Memristor-Based Neural Network Fabricated, Characterized

AFRL's in-house Computational Intelligence research group, led by Dr. Robinson E. Pino, has achieved a critical milestone in the design, fabrication, and characterization of a 100-synapse memristor-based neural network. In collaboration with Boise State University (BSU), the team fabricated and characterized a memristor-based neural network, leveraging BSU-developed ion-conductor chalcogenide-based memristor devices.

The characterization results demonstrate that neural networks containing 100 interconnected memristor-based synapses can be programmed individually to various

memristive states. For example, we have programmed three distinct memristance states for each of the 100 memristor-based synapses in the neural network.

The Computational Intelligence group has been working for over four years developing cognitive computing architectures to enhance the robust decision-making capabilities of the Air Force. Today is the age of information overflow, and the Advanced Computing Architectures division has foreseen the need to develop computing technology with the ability to perform autonomous intelligent functions that will enhance the performance of the warfighter.



*Decision-making capabilities of the Air Force are enhanced by neural networks containing 100 interconnected memristor-based synapses that can be programmed individually. (AFRL Image)*