UROC Fall 2023 Opportunities

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School of Computer Science
The past 30-50 years has seen great improvements in power and performance due to transistor scaling.

But.. This scaling is coming to an end. We need new technologies and techniques to continue scaling power and performance.
The Rogues Gallery is a novel architecture testbed with technologies that are currently too “rogue” for mainstream computing.
What are we trying to do?

• We are looking at novel hardware and ways to program them via a new testbed called the Rogues Gallery.

What have previous students looked at?

• Machine learning for image recognition on the Emu Chick, a novel machine where computation moves rather than data
• Neuromorphic applications for graph analysis and genomics with the FPAA
• Quantum computing – analysis of tools and benchmarking for current-generation systems
VIP Team Details

Class meets at 10-10:50 Wednesdays on Coda 12th floor
• 1-3 credit hours; most work happens with your sub-team!

Possible teams:
• Near-memory
• Neuromorphic Simulation and FPAA framework
• Quantum Computing
• Reconfigurable Computing

What skills are needed?
• Minimum: Good knowledge of Linux, SSH, previous programming experience (C/C++/Python), linear algebra
• Preferred: Having taken ECE 3400 (for the FPAA), CX 4220 (for near-memory), CS 3220 (reconfigurable)
Additional Research Opportunities

Software Engineering for Scientific Computing
• Improving the quality of scientific simulations via better software engineering
• We have a new Open Source Program Office to promote open-source computing best practices

CRNCH Rogues Gallery Development
• Helping to build new documentation and tutorials to support novel architectures as part of the Rogues Gallery
• Working on near-memory benchmarks like Spatter

Neuromorphic Research Framework Development
• Mapping neuromorphic algorithms to the Field Programmable Analog Array using RASP and Nengo tools

Please see https://jyoung3131.github.io/students/student-research/ for more details.
Sign up for our VIP team or reach out for research opportunities
https://www.vip.gatech.edu/teams/vwa

See general research opportunities at
https://jyoung3131.github.io/students/student-research/

Email questions to Dr. Young - jyoung9@gatech.edu