• University of California, Irvine
  – Department of Cognitive Sciences
  – Department of Computer Science
• Lead Investigator – Professor Jeff Krichmar
• Current team members:
  – Michael Beyeler, Kris Carlson, Nikil Dutt
• Our team has expertise in:
  – Computational Neuroscience & Neuroinformatics
  – Large-scale parallel computing
  – Neurorobotics
• Participated in IARPA ICArUS and DARPA SyNAPSE.
Developed tools for simulating cortical circuits of spiking neurons.

- Flexible, easy-to use, efficient.
- Exploits graphical processing unit (GPU) parallelism.
- Provides an automated parameter tuning framework for spiking neural networks.

Simulation environment, framework and examples are available at:
http://www.socsci.uci.edu/~jkrichma/CARLsim
• Generated models of cortical microcircuits informed and constrained by existing neuroscience literature to elucidate cortical computing primitives such as:
  – Object recognition and motion perception in visual cortical streams.
  – Attention in thalamocortical circuits.
  – Working memory in frontal cortex.

From:
• Avery et al., Eur J Neurosci, 2014
• Avery et al., Front Comput Neuro, 2013
• Beyeler et al., Neuroinformatics, 2014
• We believe we can immediately contribute to technical area #3, “Generate computational neural models of cortical microcircuits informed and constrained by this data and by the existing neuroscience literature to elucidate the nature of the cortical computing primitives”.

• We seek to join team(s) that have:
  – “data on the structure and function of cortical microcircuits.”

• We would work together to:
  – Build an “algorithmic framework for information processing.”
  – Implement “novel machine learning algorithms that use mathematical abstractions of the identified cortical computing primitives.”
Contact Information

- Jeffrey L. Krichmar, Ph.D.
- Professor
- University of California, Irvine
- jkrichma@uci.edu
- 949-824-5888
- http://www.socsci.uci.edu/~jkrichma