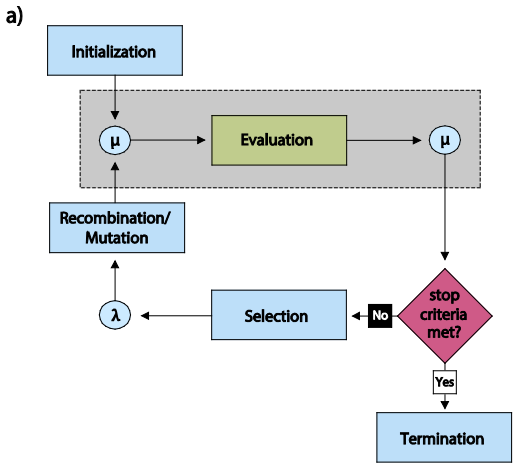
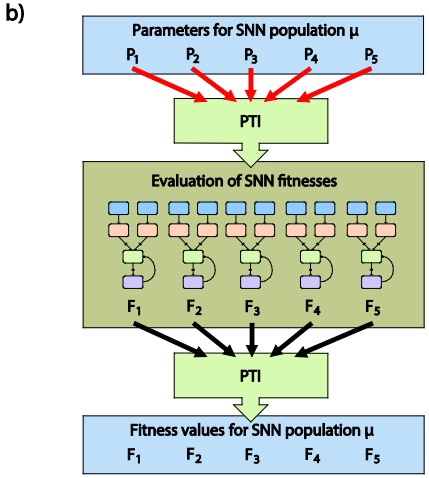
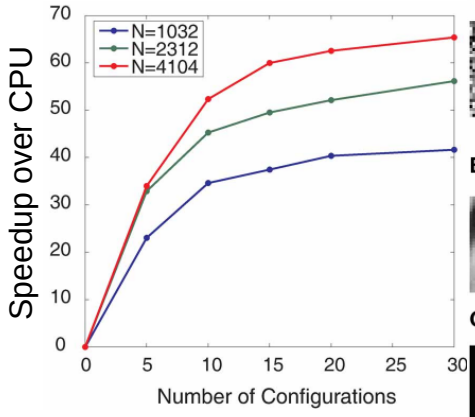
- University of California, Irvine
  - Department of Cognitive Sciences
  - Department of Computer Science
- Lead Investigator – Professor Jeff Krichmar
- Current team members:
  - Michael Beyeler, Kris Carlson, Nikil Dutt
- Our team has expertise in:
  - Computational Neuroscience & Neuroinformatics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

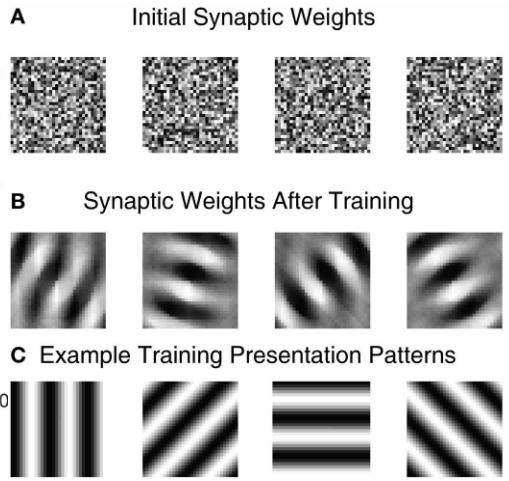
From Carlson et al., Front Neurosci, 2014

- 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.





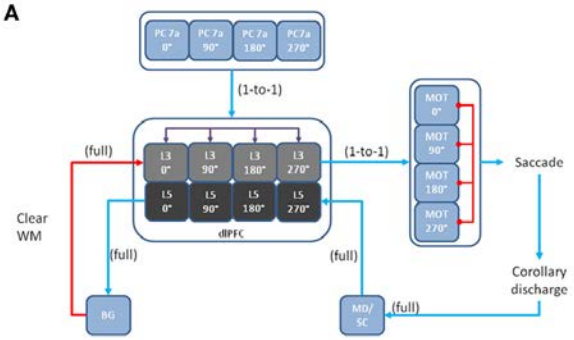




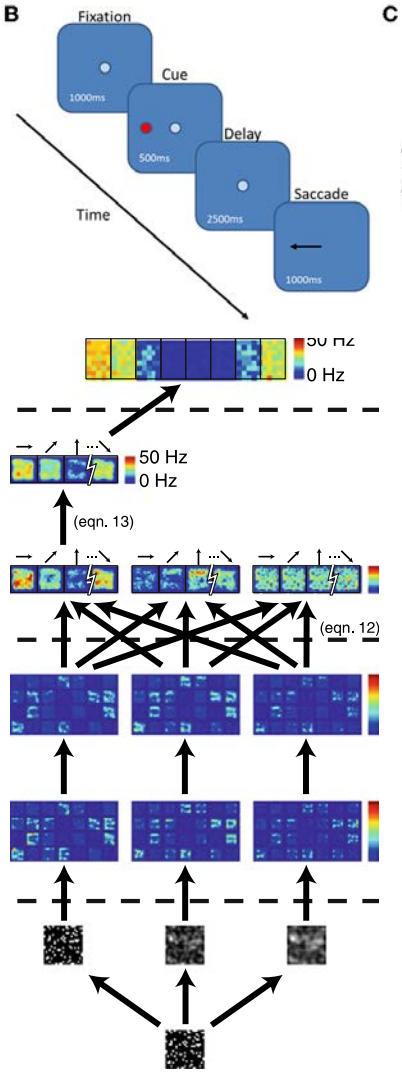
Simulation environment, framework and examples are available at:
http://www.socsci.uci.edu/~jkrichma/CARLsim

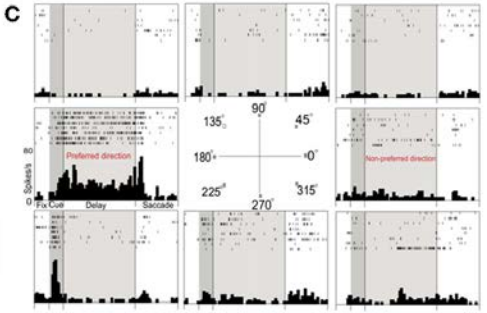
From:

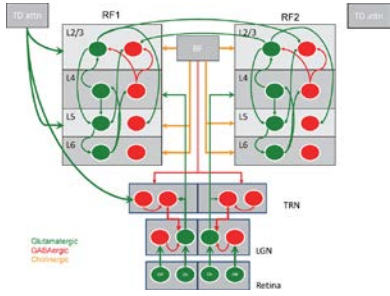
- Avery et al., Eur J Neurosci, 2014
- Avery et al., Front Comput Neuro, 2013
- Beyeler et al., Neuroinformatics, 2014

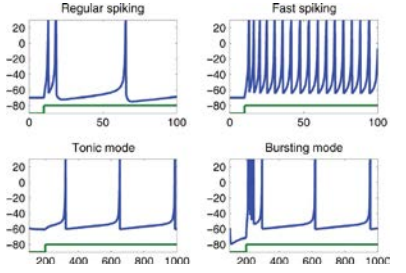


- Generated models of cortical microcircuits informed and constrained by existing neuroscience literature to elucidate cortical computing primitives such as:
  - Object recognition and motion perception in visual cortical streams.
  - Attention in thalamocortical circuits.
  - Working memory in frontal cortex.









- 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

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