

LeafLabs

Neurotechnology

Big Data for Neuroscience

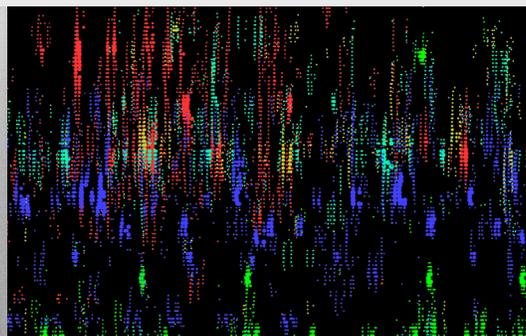
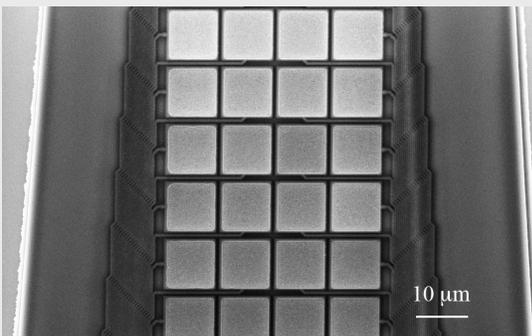
LeafLabs engineers solutions to the big data challenges presented by modern neuroscience experiments. We specialize in the acquisition, storage, and processing of huge amounts of neural data from a variety of sensing modalities.

Services

- Custom R&D
- Technical Consulting
- Equipment Rentals
- Grant Support

Technical Expertise

- Embedded Systems: FPGA, MCU, SOC
- Real-time Data Analysis
- High-Performance Computing
- Big Data Management



Novel Sensor
Technologies

Massive Data
Challenges

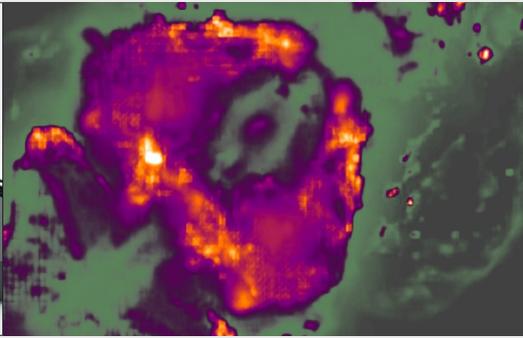
Scalable
Architectures

Case Studies



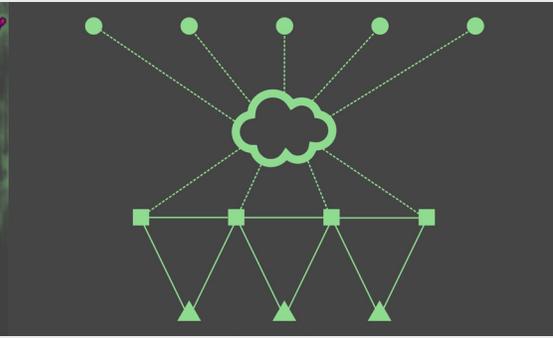
Willow

What can in-vivo electrophysiology teach us at the 1000 neuron scale? LeafLabs teamed up with the Boyden Lab at MIT to develop high-density silicon probes, modular headstages, and a novel recording system capable of scaling to thousands of channels of full-band neural data. Since its launch, the Willow system has been used in neuroscience labs across the country to record from different brain regions under a variety of experimental conditions.



Lotus

Light-field microscopy is a functional, plenoptic imaging technique which offers ultrahigh spatial and temporal resolution for 3D tissue samples. Lotus aims to scale up the light-field method by orders of magnitude, using custom optics, state-of-the-art voltage indicators, and high-speed image sensors. The goal is to simultaneously record action potentials from every neuron in the zebrafish brain.



Aspen

As promising new methods gain footing in the lab, neuroscience datasets are becoming too large to practically manage. Aspen circumvents this bottleneck by integrating the acquisition, storage, and processing of experimental data into a unified architecture that combines principles from distributed systems and high-performance computing. The system is designed to support Lotus-scale data rates, Willow-scale storage, and team-wide collaborations.



Massachusetts
Institute of
Technology



National Institutes
of Health

LeafLabs has been an instrumental part of our neurotechnology efforts at SNG. Their full-stack approach to systems design is enabling us to develop cutting-edge prototypes from the lab into real, useful tools that are transforming neuroscience.

Ed Boyden

Director, Synthetic Neurobiology Group,
MIT

Contact Us!

Want to learn more? Visit us at www.leaflabs.com or email our team at neuro@leaflabs.com.