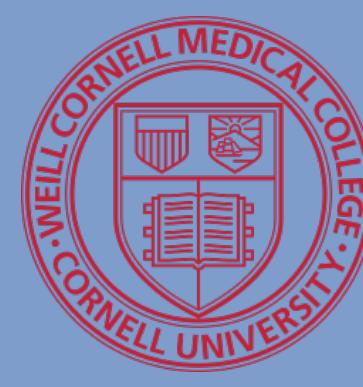




**Real-Time  
eXperiment  
Interface**

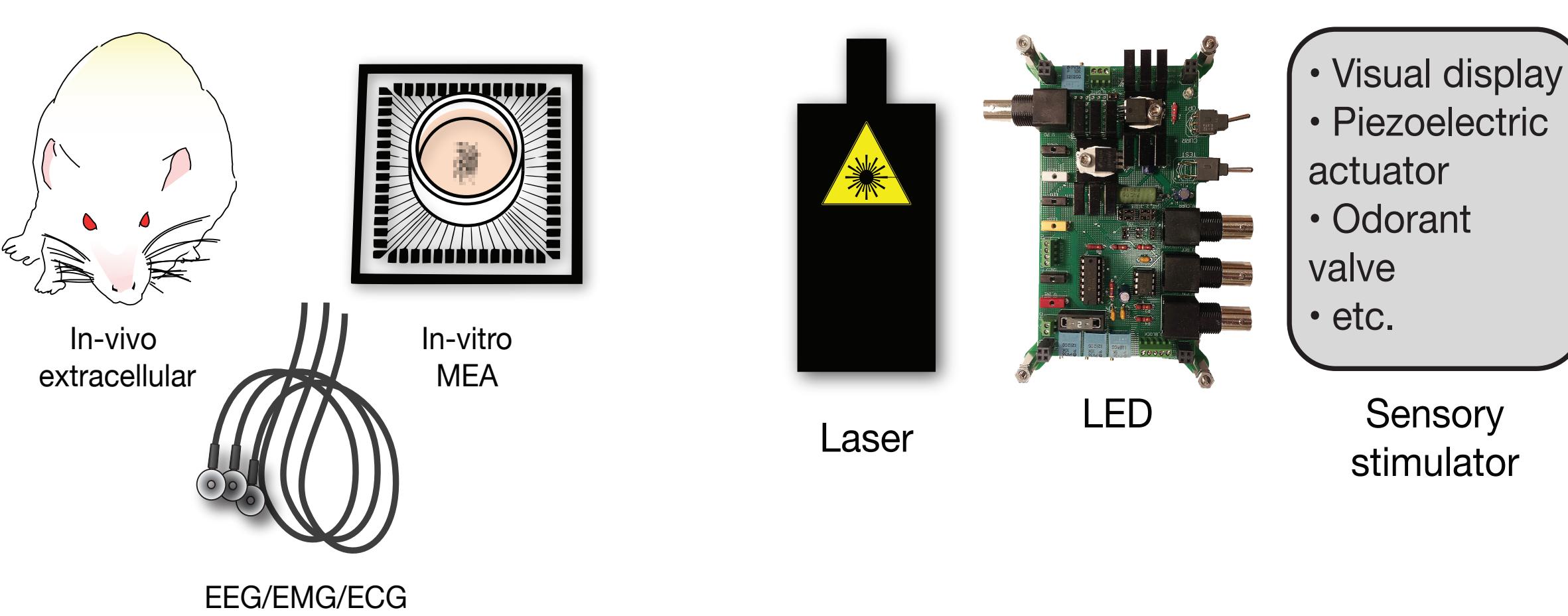
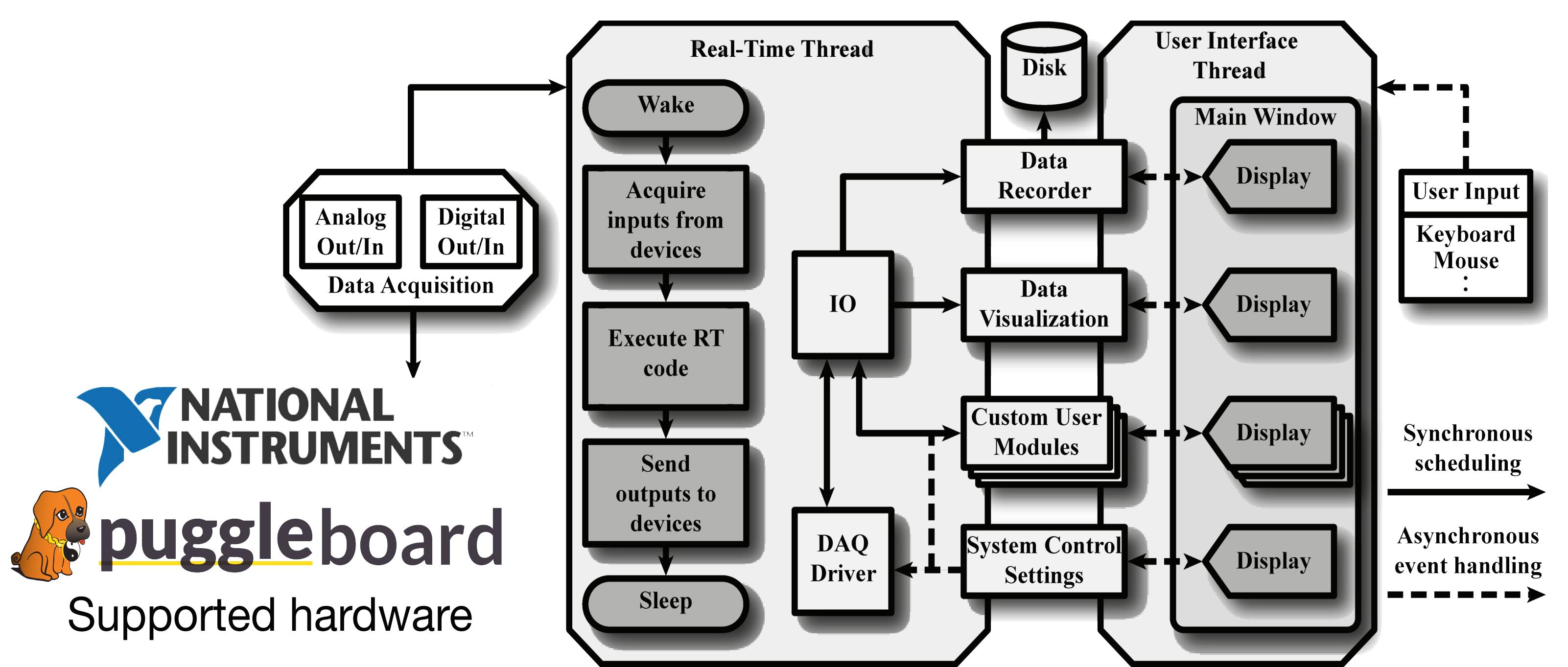
a closed-loop, open-source data acquisition platform  
with sub-millisecond latencies for electrophysiology



THE  
UNIVERSITY  
OF UTAH

Georgia  
Tech

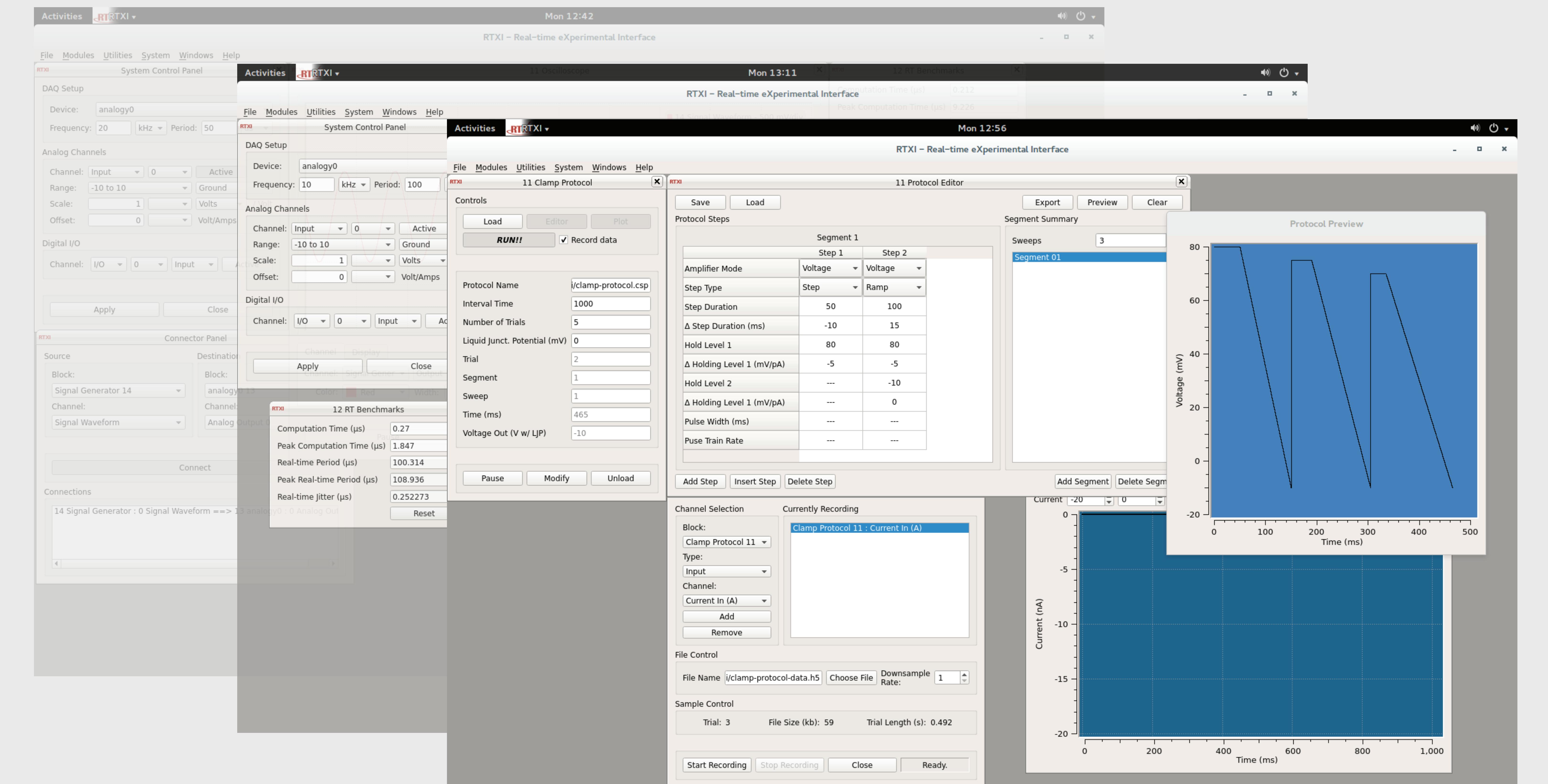
NIH RTXI is funded by NIH grant 2R01EB016407-09A1



Inputs from a variety of sources

Digital and analog outputs to drive various stimulators

## Platform overview



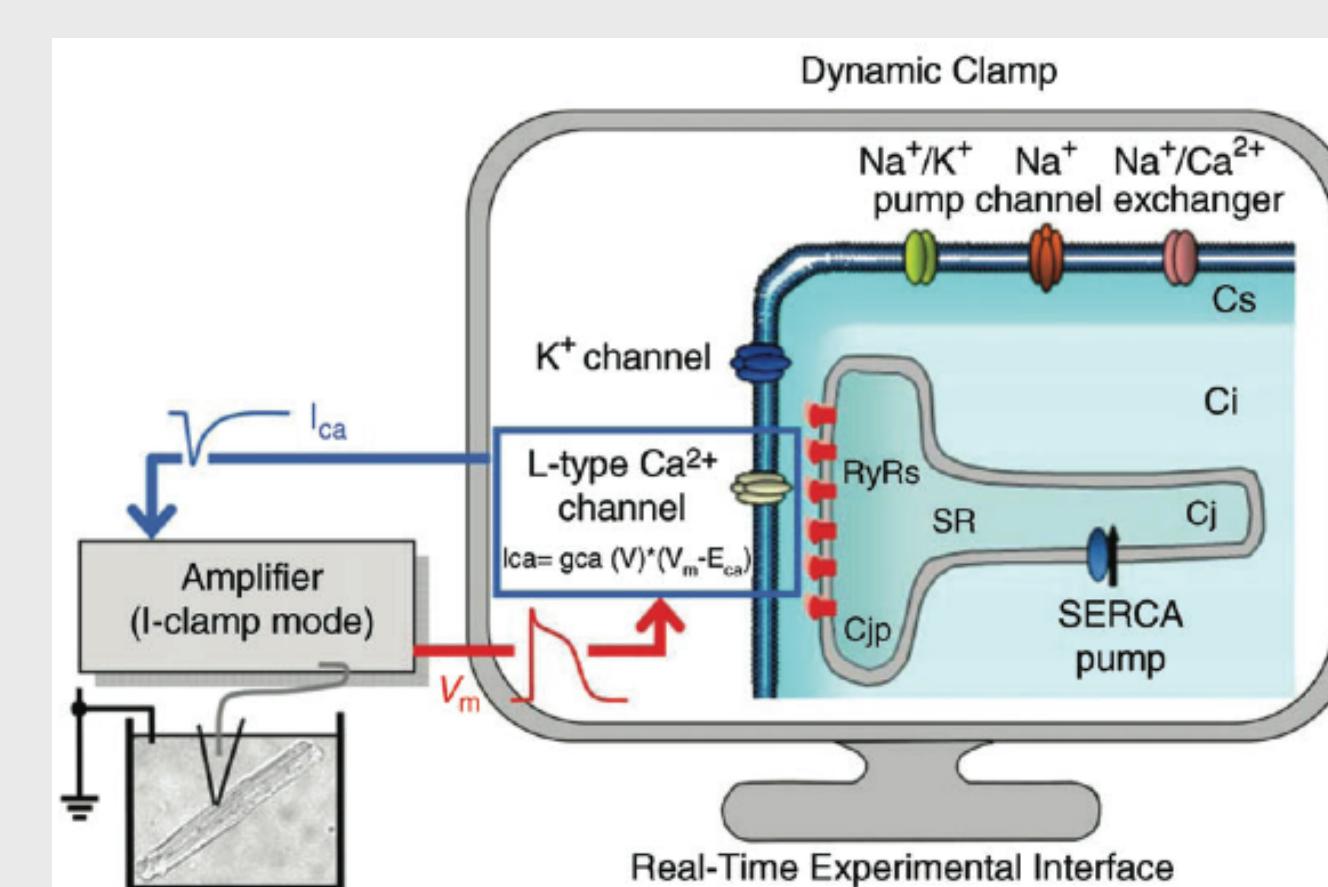
## Key features

### Modular framework

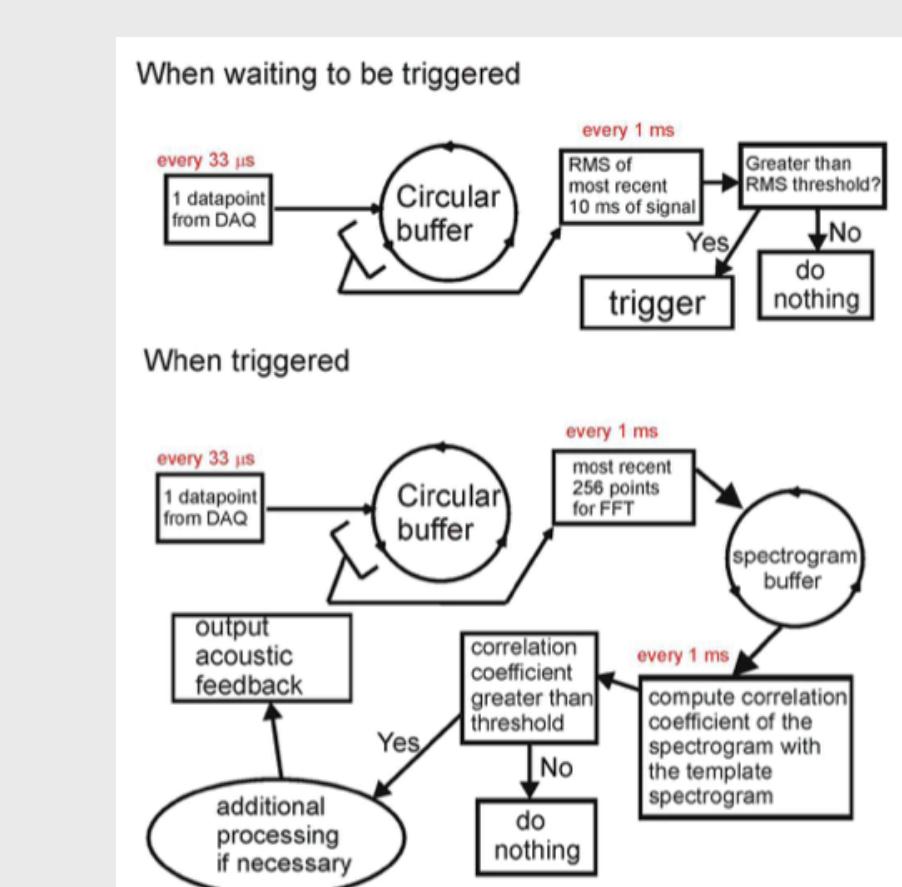
- + Dynamic loading/unloading of modules into signal chain
- + Easy to create custom modules for online and offline processing
- + Written in C++ and uses Qt
- + Over 45 modules currently available for a variety of processing and I/O control

### Free and open-source

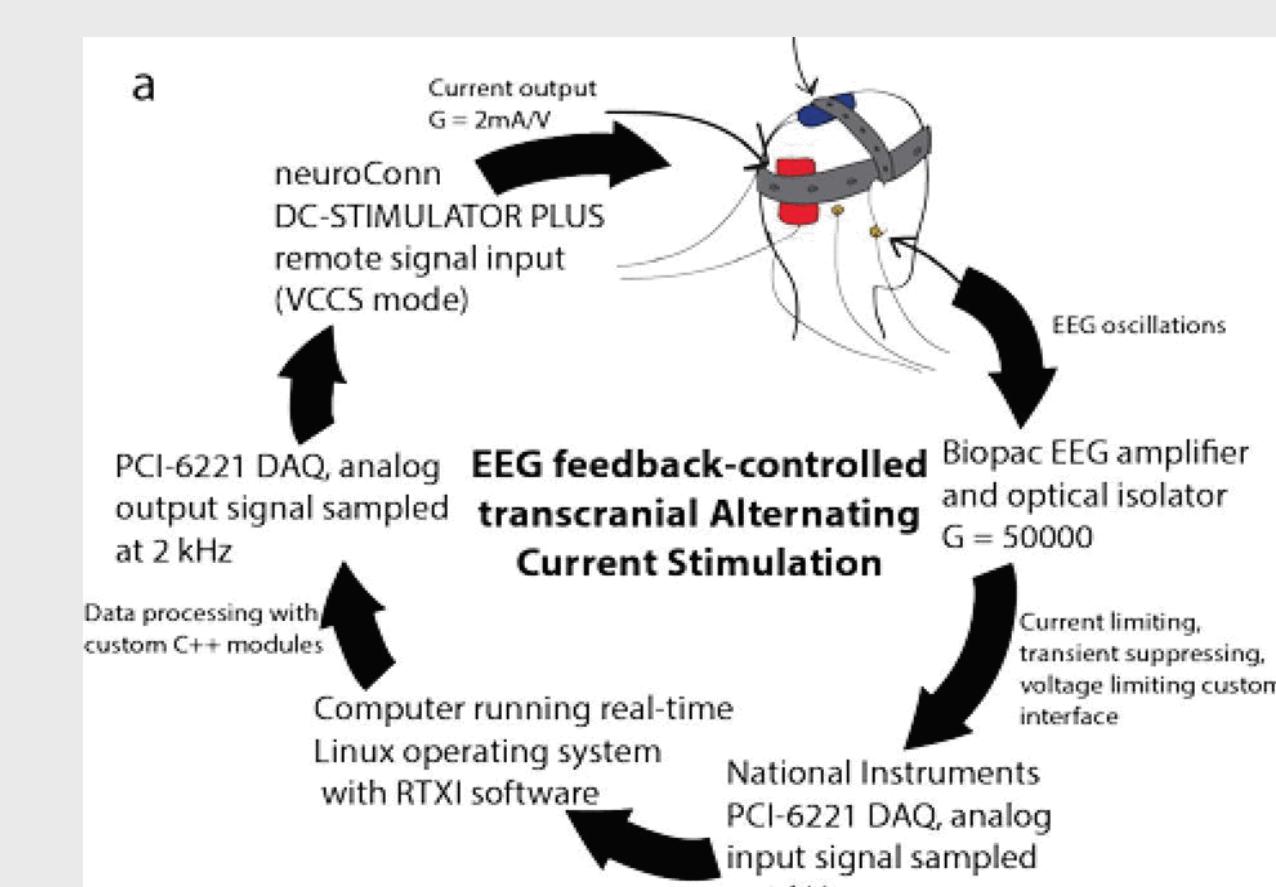
- + All code is free and open-source
- + Linux: free and compatible with any modern desktop
- + Xenomai: modification to Linux that runs in real-time
- + Analogy: community driven drivers for a variety of DAQs



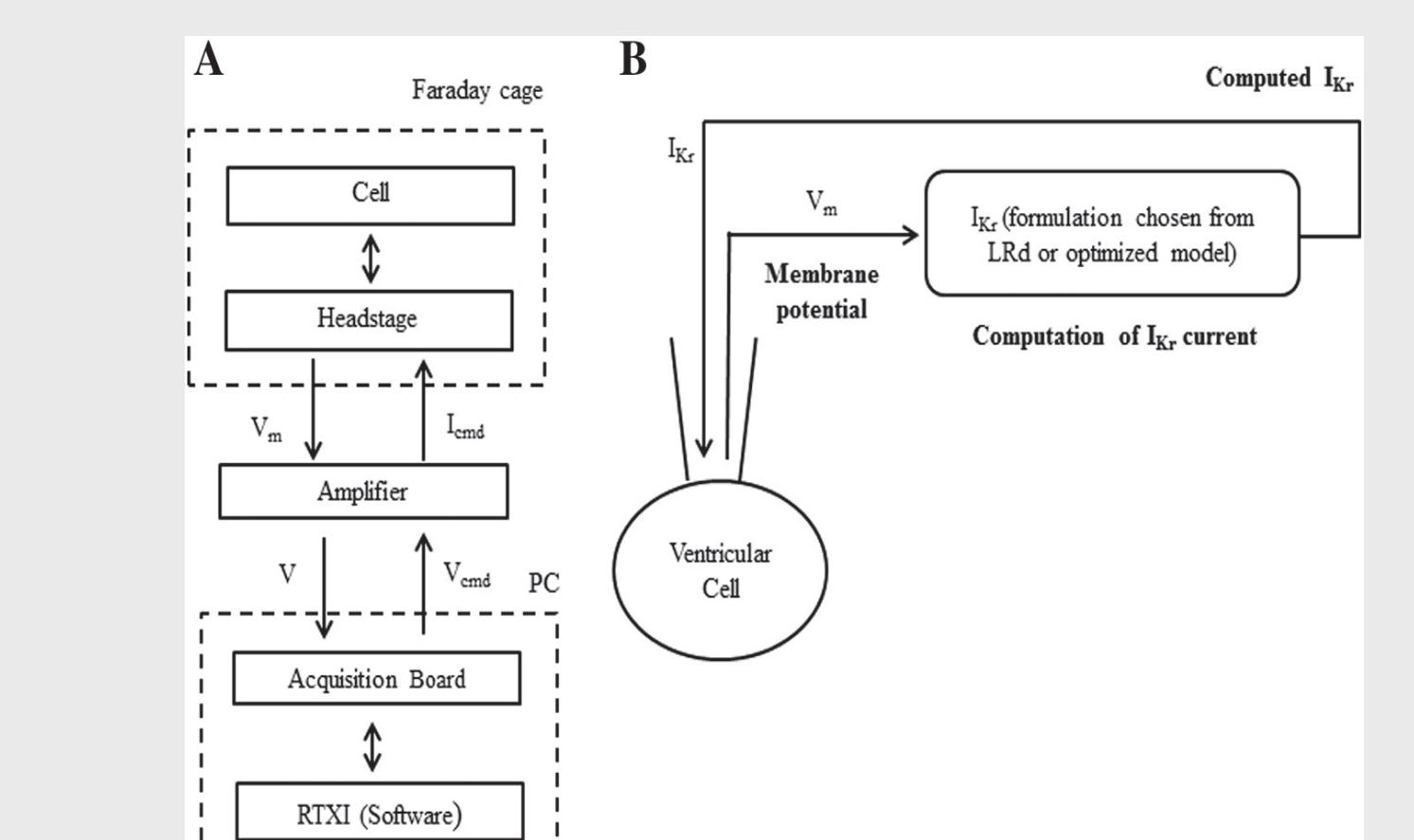
Madhvani, Roshni V., et al. "Shaping a new  $\text{Ca}^{2+}$  conductance to suppress early afterdepolarizations in cardiac myocytes." The Journal of physiology 589.24 (2011): 6081-6092.



Skocik, Mike, and Alexey Kozhevnikov. "Real-time system for studies of the effects of acoustic feedback on animal vocalizations." Frontiers in neural circuits 6 (2012).



Boyle, Michael R., and Flavio Froehlich. "EEG feedback-controlled transcranial alternating current stimulation." Neural Engineering (NER), 2013 6th International IEEE/EMBS Conference on. IEEE, 2013.

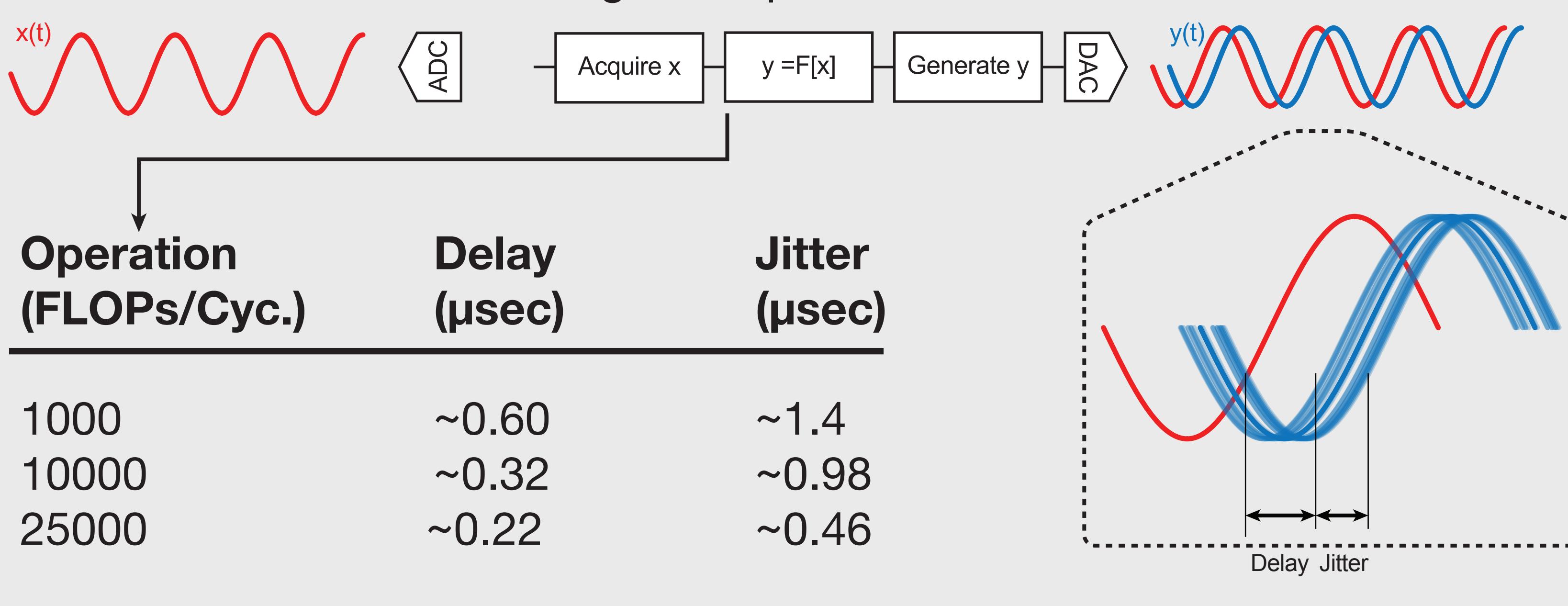


Chiara Bartolucci et al. "Combined action potential- and dynamic-clamp for accurate computational modelling of the cardiac IKr current." Journal of Molecular and Cellular Cardiology. Vol. 79, February 2015, Pages 187–194.

## Hard real-time, closed-loop performance

### Real-time kernel

- + Real-time threads make loop times deterministic
- + RTXI: RTLinux based biosignal acquisition software



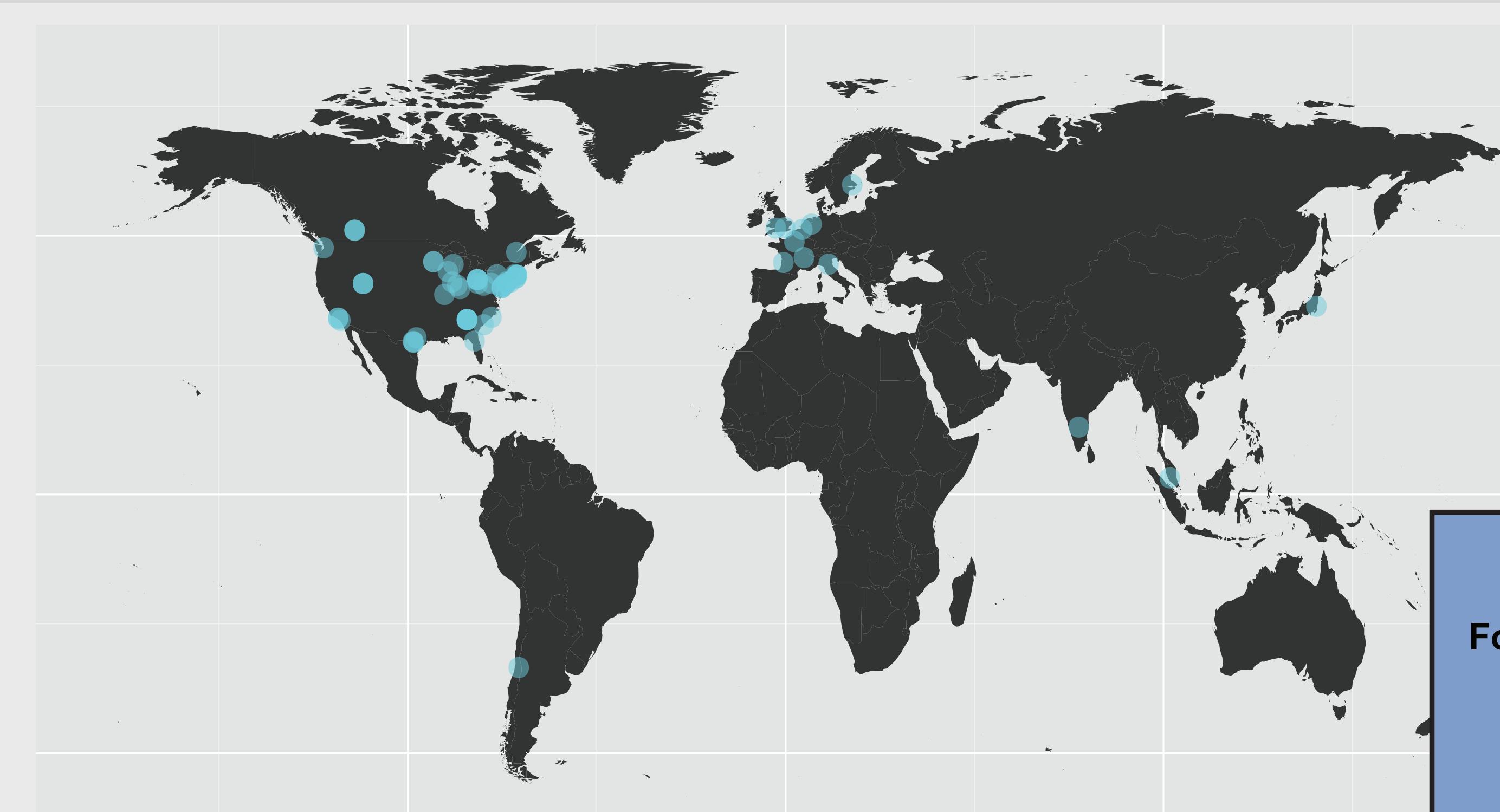
## RTXI Resources and Community

### Information available online:

- + 32 and 64-bit Live CDs and installation instructions
- + Source code
- + Publications with relevant RTXI modules
- + FAQs, Bug reports, feature requests, contact information

### Other resources available:

- + Full-time technical support via email/phone
- + On-site installation and troubleshooting support (upon request)
- + Remote installation and troubleshooting



Learn more  
[www.rtxi.org](http://www.rtxi.org)  
Fork us on GitHub  
[github.com/rtxi](https://github.com/rtxi)