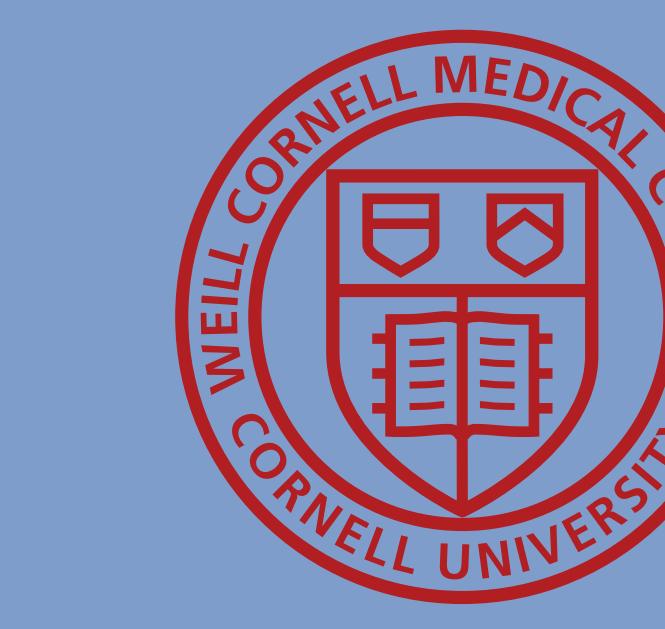
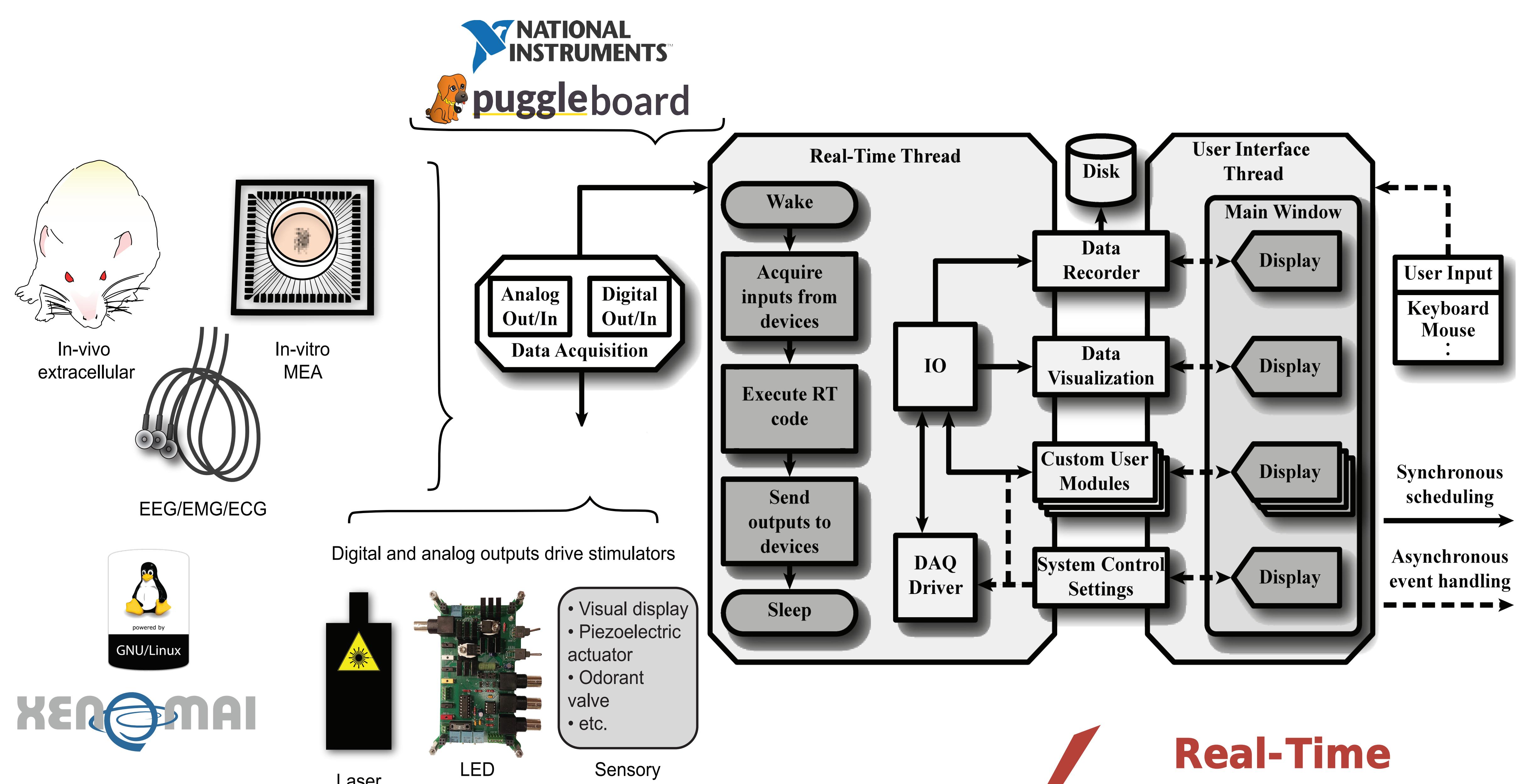


The Real-time eXperiment Interface: a closed-loop, open-source data acquisition platform with sub-millisecond latencies for electrophysiology

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The Real-Time eXperiment Interface, or RTXI, is a closed-loop, hard real-time data acquisition and control system for electrophysiology. It is at the intersection of many open-source initiatives that provides a mature and extensible framework for designing and carrying out experiments. RTXI is free software that runs on almost any modern desktop. All that's needed is a compatible data acquisition card. It can be used to simultaneously handle multichannel data acquisition and stimulation, couple biological systems with complex computational models, and record multiple channels to disk - all at microsecond latencies. To date, RTXI has been used by over 60 labs worldwide and is cited in over 70 publications.



Key features

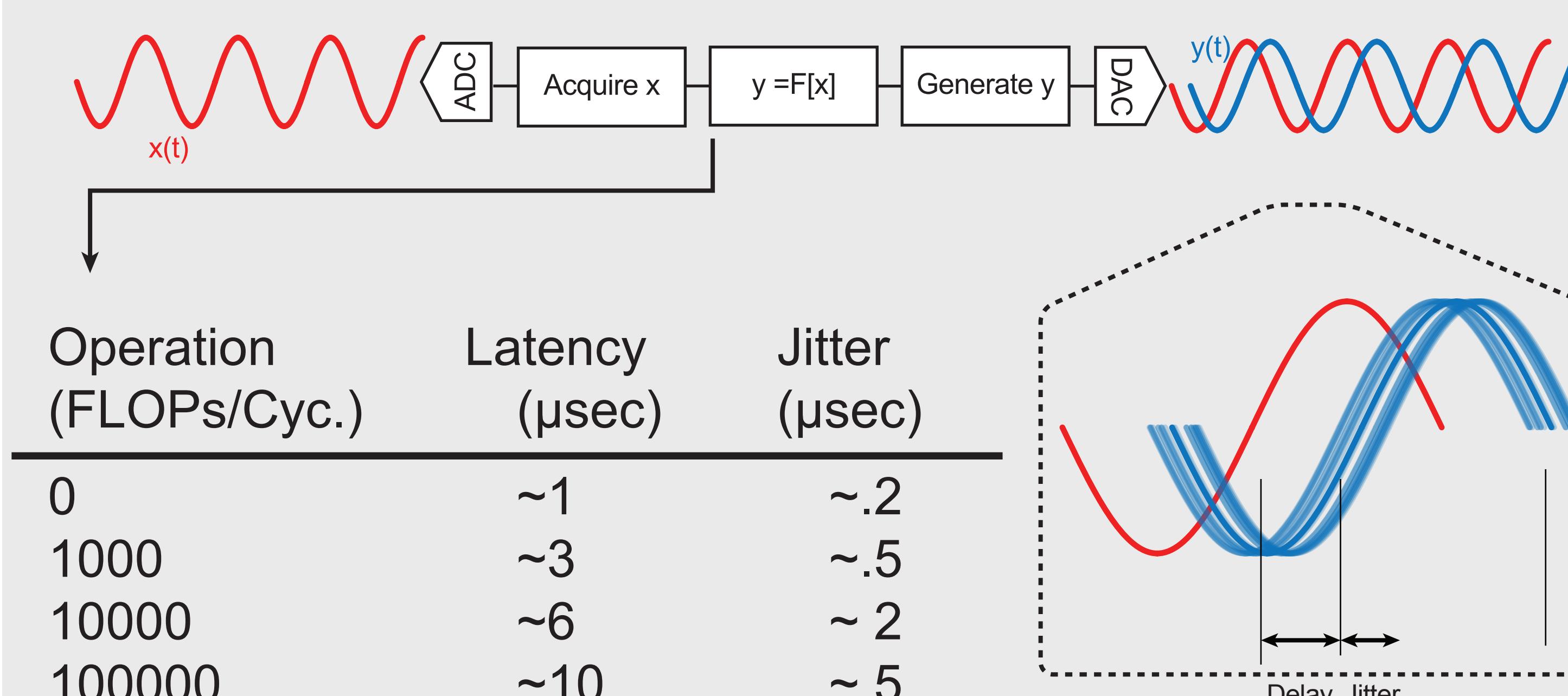
Modular framework

- + custom protocols are integrated as standalone modules.
- + modules are dynamically loaded/unloaded in the signal chain.
- + real-time components are written in C++ and the UI uses the Qt framework.
- + a built-in abstraction model makes user-specific modules easy to create and implement.

Free and open-source

- + All code is open-source and available on GitHub.
- + Linux: it's free and compatible with any modern desktop.
- + Xenomai: the open-source real-time Linux patch.
- + Analogy: a community-driven driver set for a variety of DAQs.

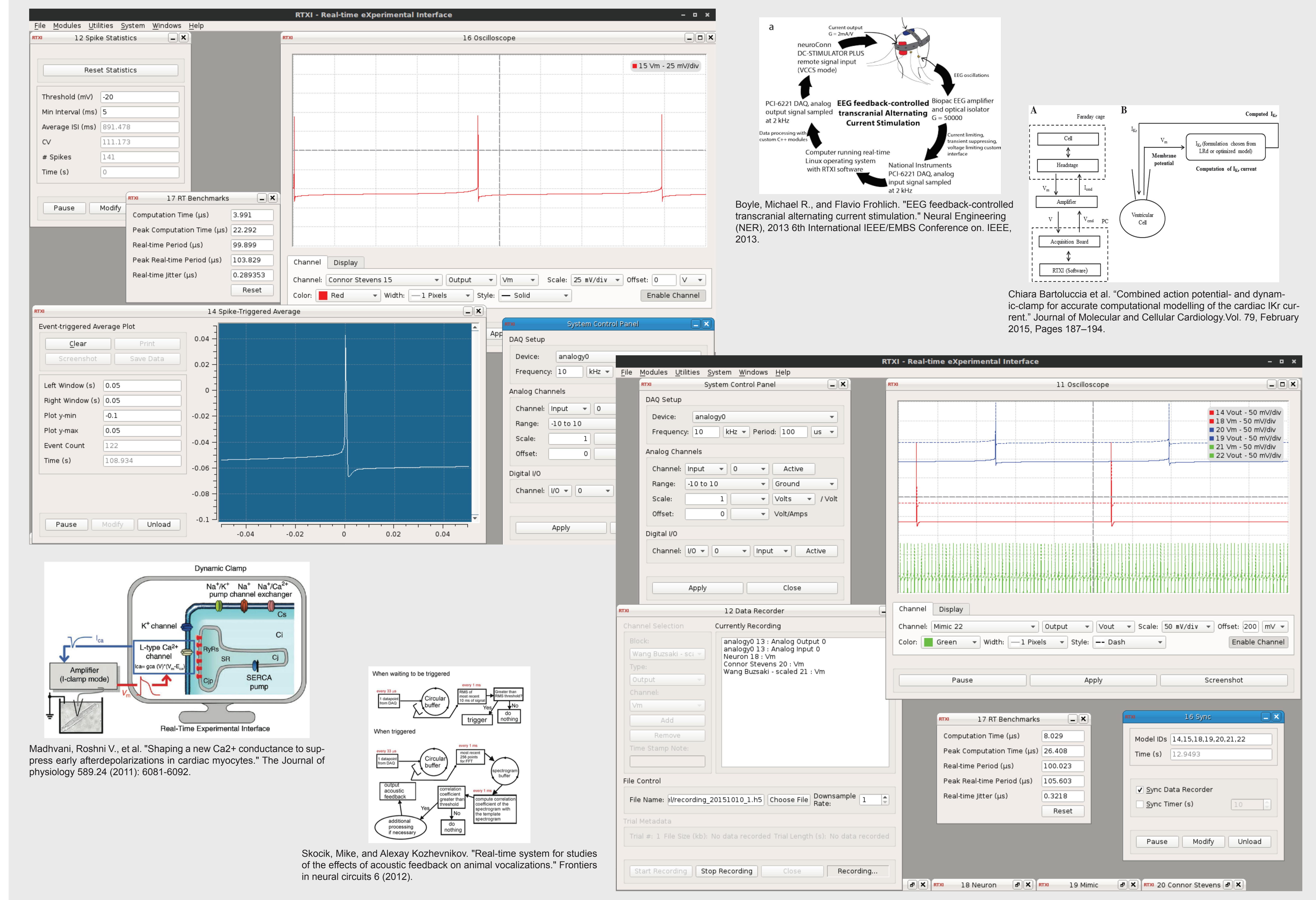
Hard real-time, closed-loop performance



The real-time (RT) kernel:

- + preempts the standard kernel.
- + guarantees deterministic loop times with RT threads.
- + uses RTLinux-based biosignal acquisition software.

Platform and interface overview



RTXI resources

Browse our website (rtxi.org) for:

- + live CDs and installation instructions.
- + tutorials and troubleshooting documentation.
- + publications that used RTXI.

Browse our code repository (github.com/rtxi) for:

- + source code.
- + bug reports and feature requests.

We also make available:

- + 24/7 technical support via email or GitHub.
- + per-request on-site assistance.



Acknowledgements

RTXI depends on the following for its continued development:

- + Linux kernel.
- + Xenomai/RTLinux.
- + The Qt project.
- + NIH grant 2R01EB016407-09A1.

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