LabVIEW Based Software for Recording Electric Organ Discharges from Weakly Electric Fish

Adam Gleichman and Jason Gallant

Mormyrid fish produce electric organ discharge (EOD) pulses in water with a specialized electric organ, which is used in communication and navigation. To better understand the behavior of these fishes, accurate recordings of their EOD behavior are critical. Using LabVIEW (National Instruments, Inc.), we developed a software program capable of recording and visualizing EOD behavior in real time. A requirement of such software is the ability to record electric discharges at high sampling rates (100khz-1MhZ ) over a wide range of durations (10ms - 1hr). Due to limited hardware capabilities (CPU,RAM), this we solved this difficulty using a combination of direct disk writing and dynamic down sampling of displayed data. The software features a real-time display of data for instrument calibration, as well as real-time display of data during recording. In addition, controls for A/D acquisition can be adjusted ‘on the fly’ and metadata regarding specimens can also be recorded. The software is written as a user-friendly GUI for use in the classroom and by researchers that are unfamiliar with computer programming, and will be freely available for download and install on Mac, Windows and Linux platforms.