



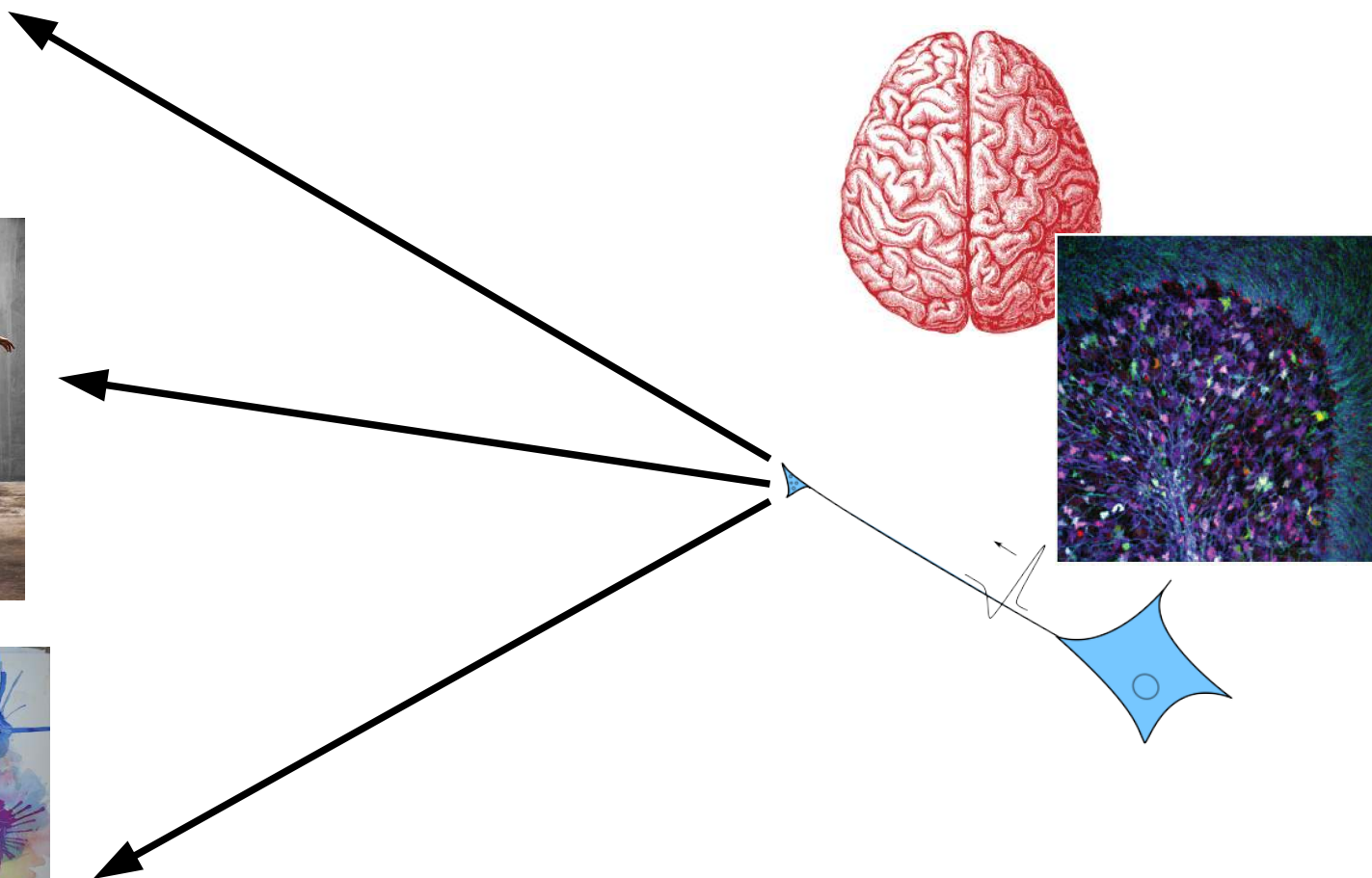
An embedded system for real-time feedback neuroscience experiments



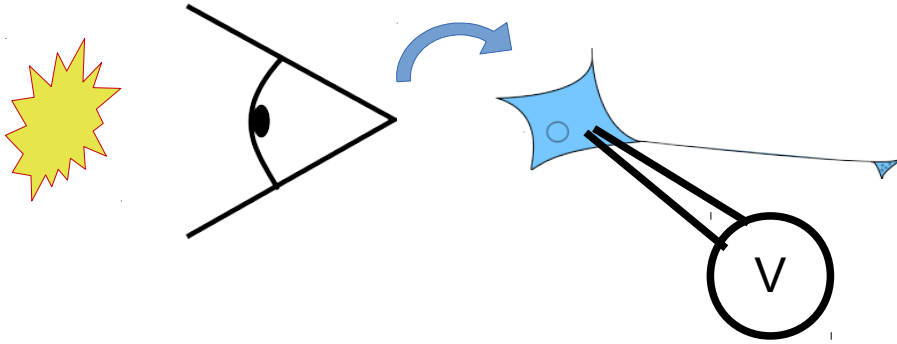
Lirio O B Almeida
Paulo Matias
Rafael T Guariento



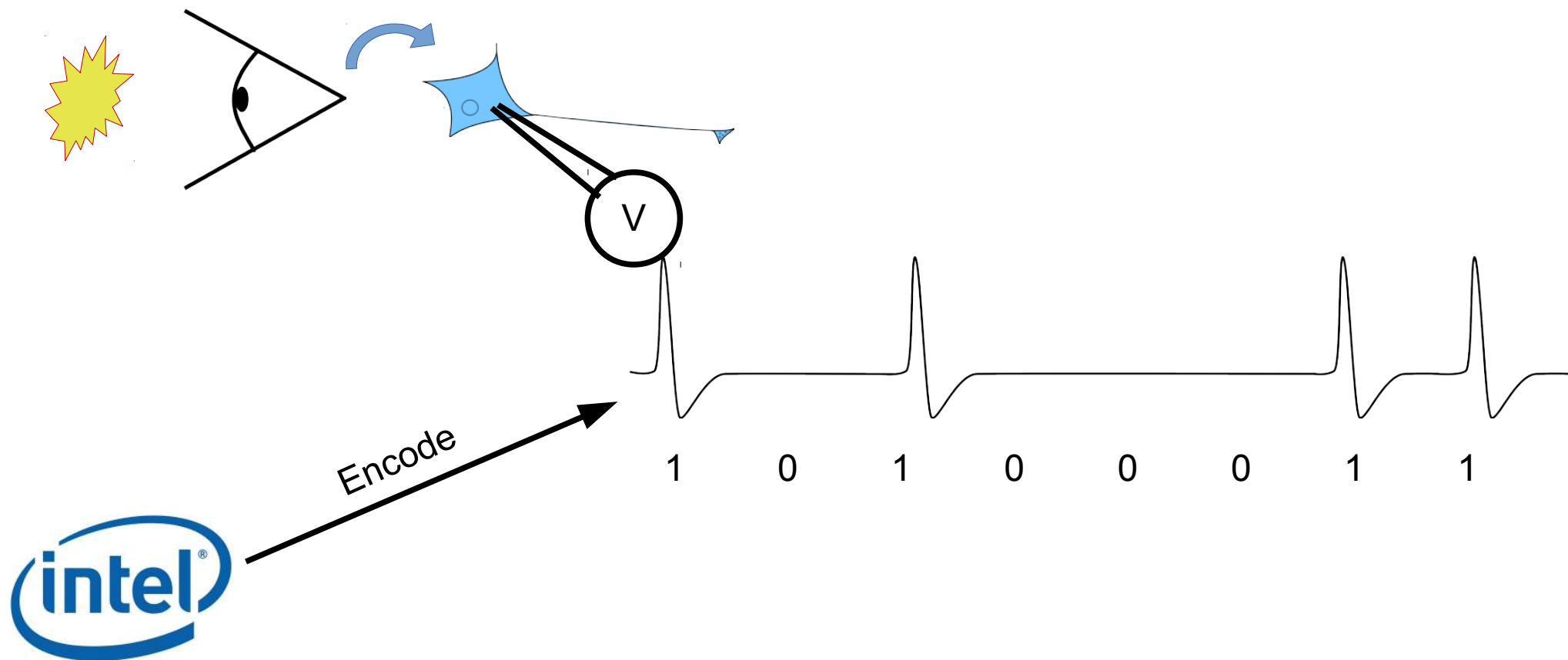
Why study neuroscience?



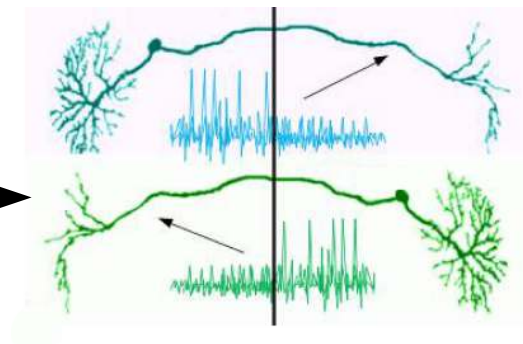
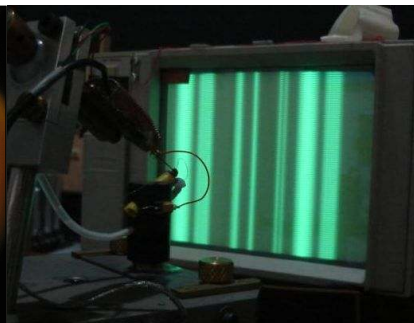
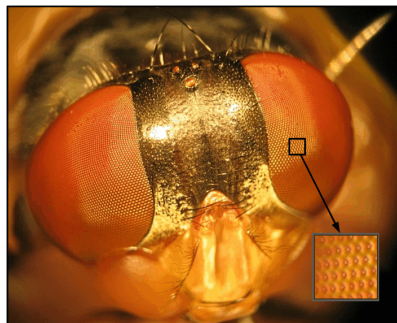
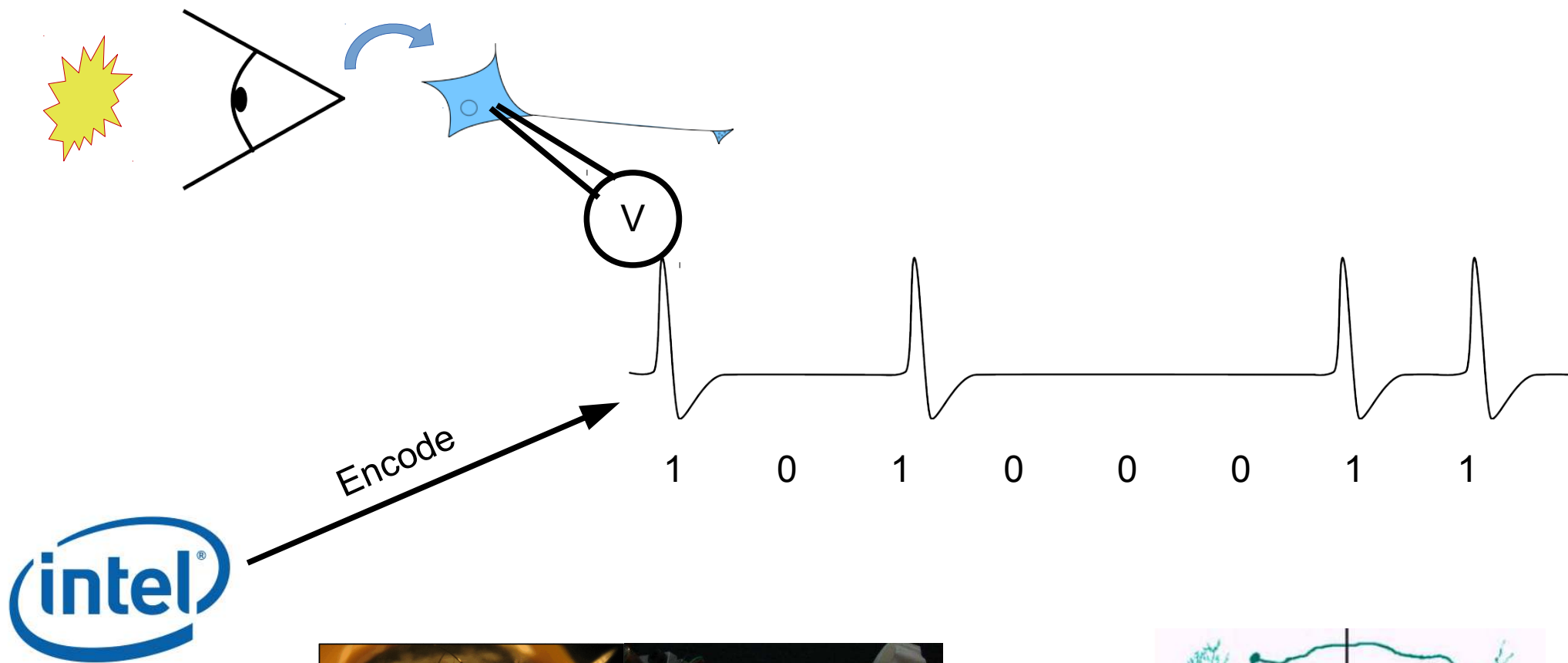
Neural Code



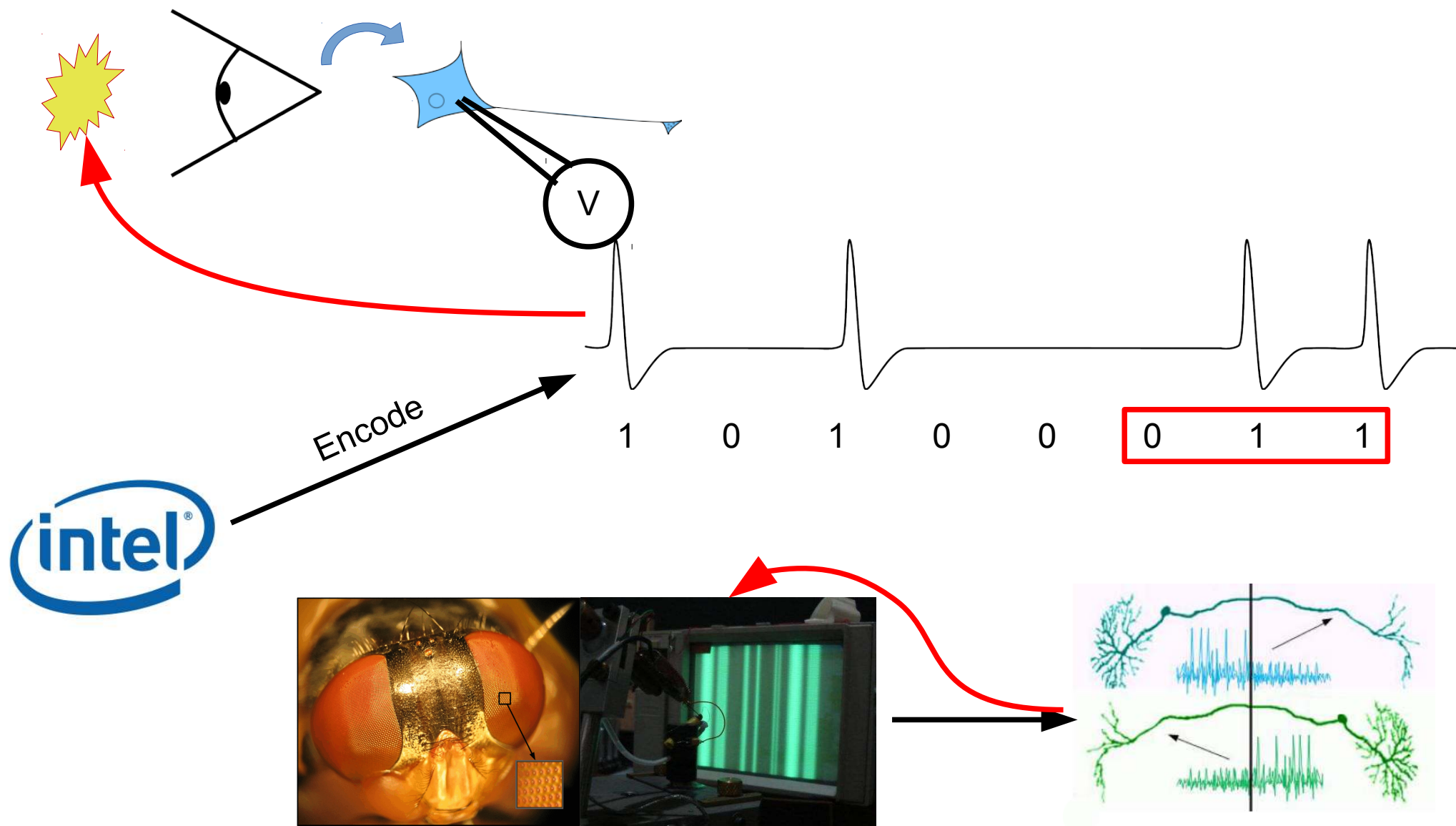
Neural Code



Neural Code

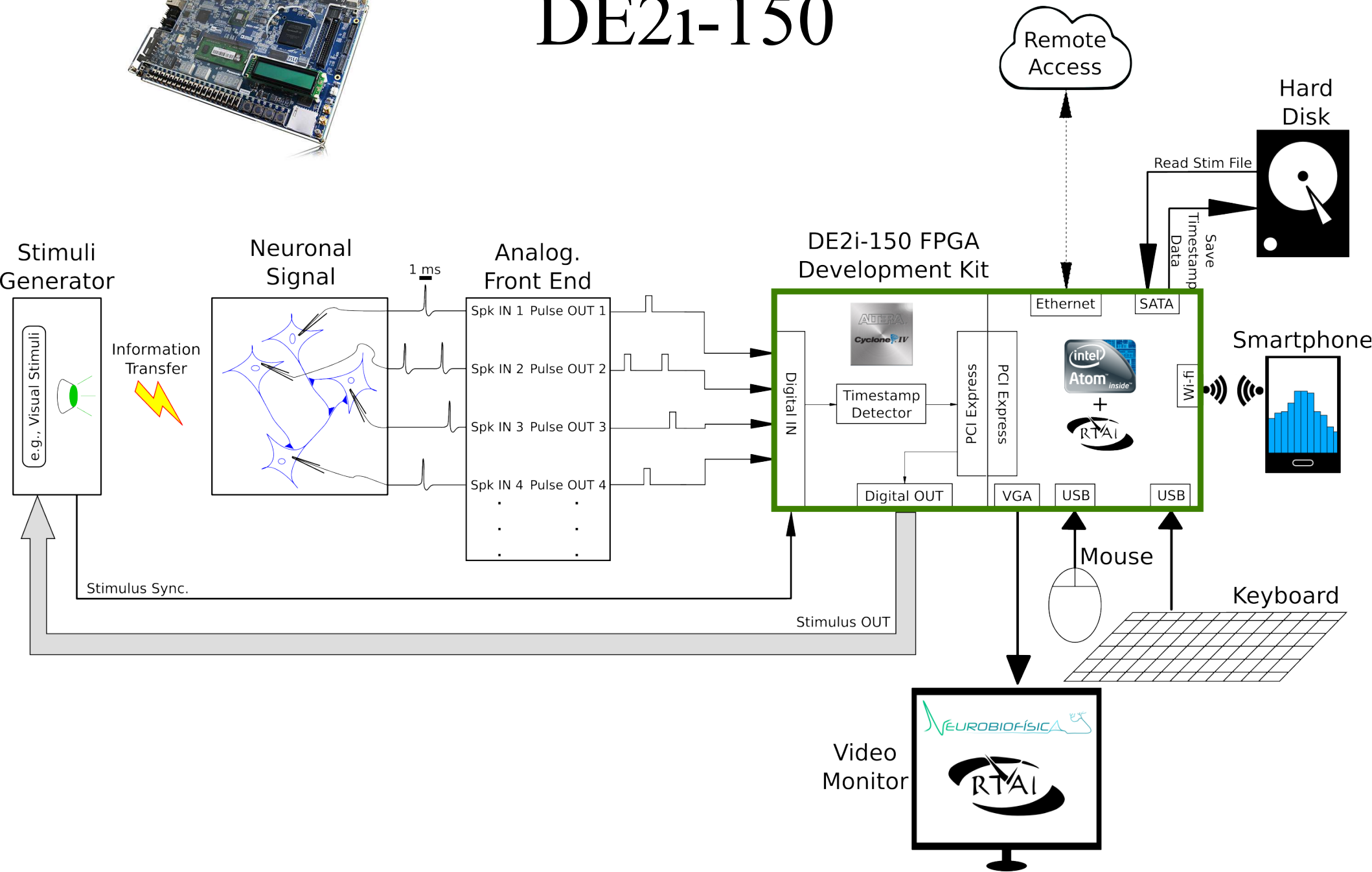


Neural Code





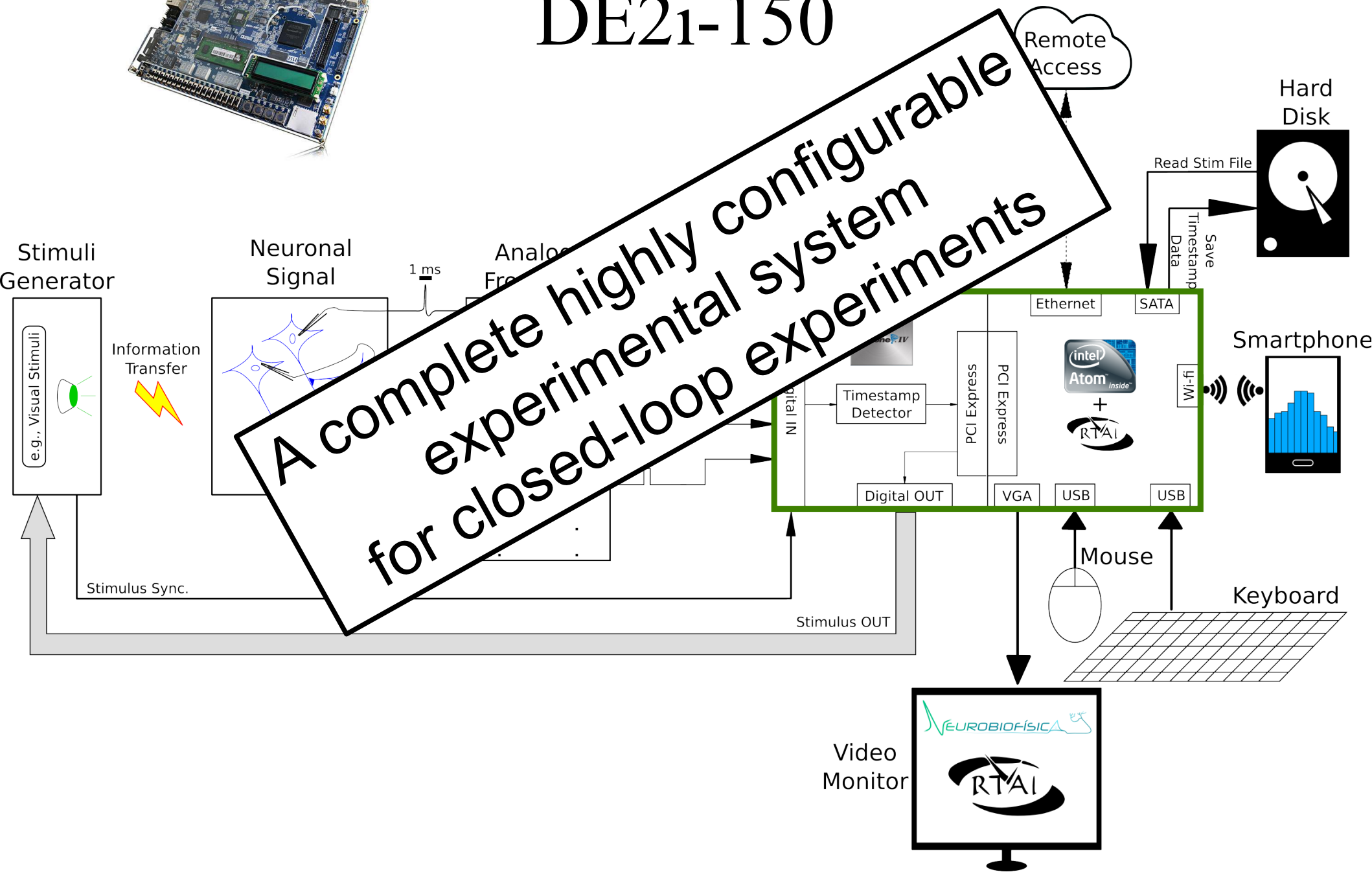
DE2i-150



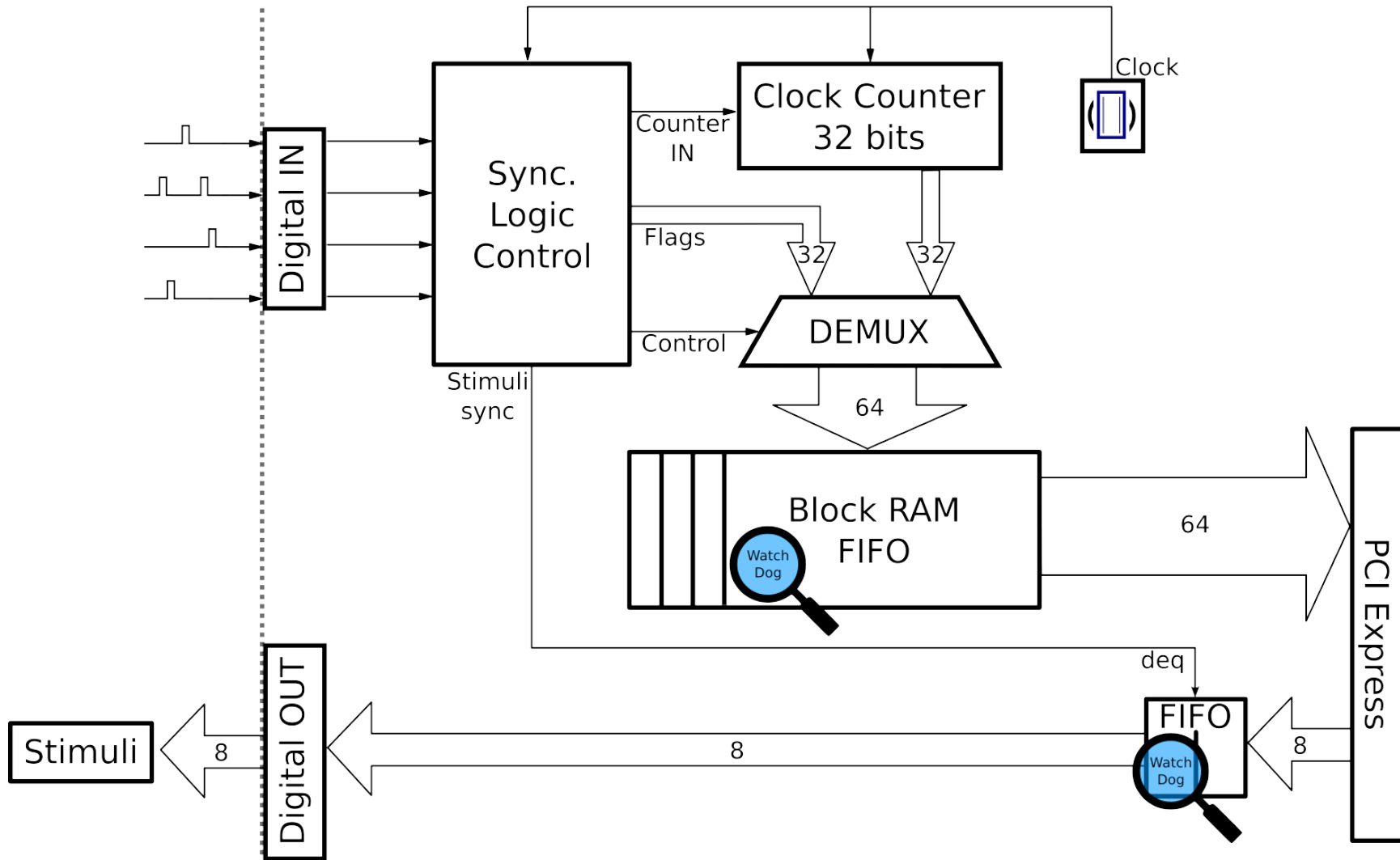


DE2i-150

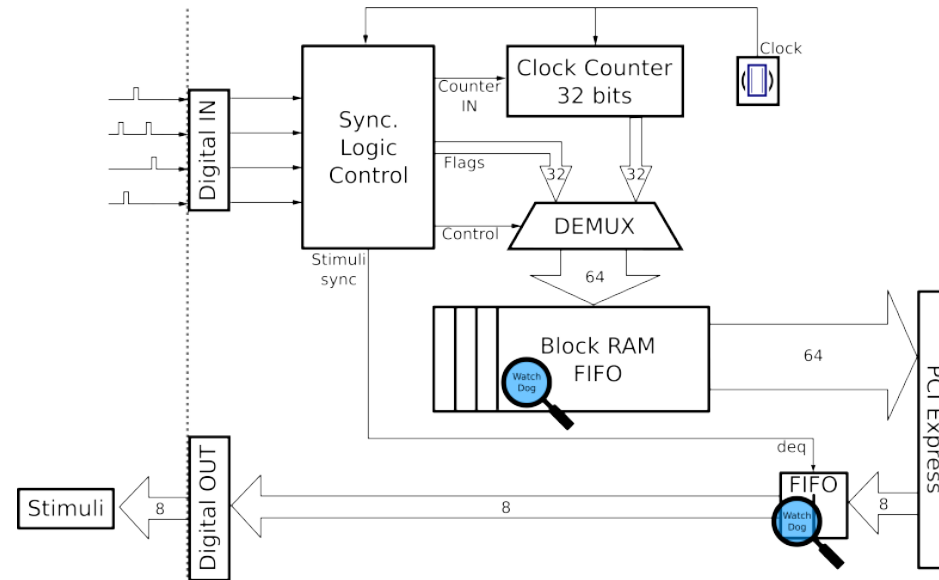
A complete highly configurable experimental system for closed-loop experiments



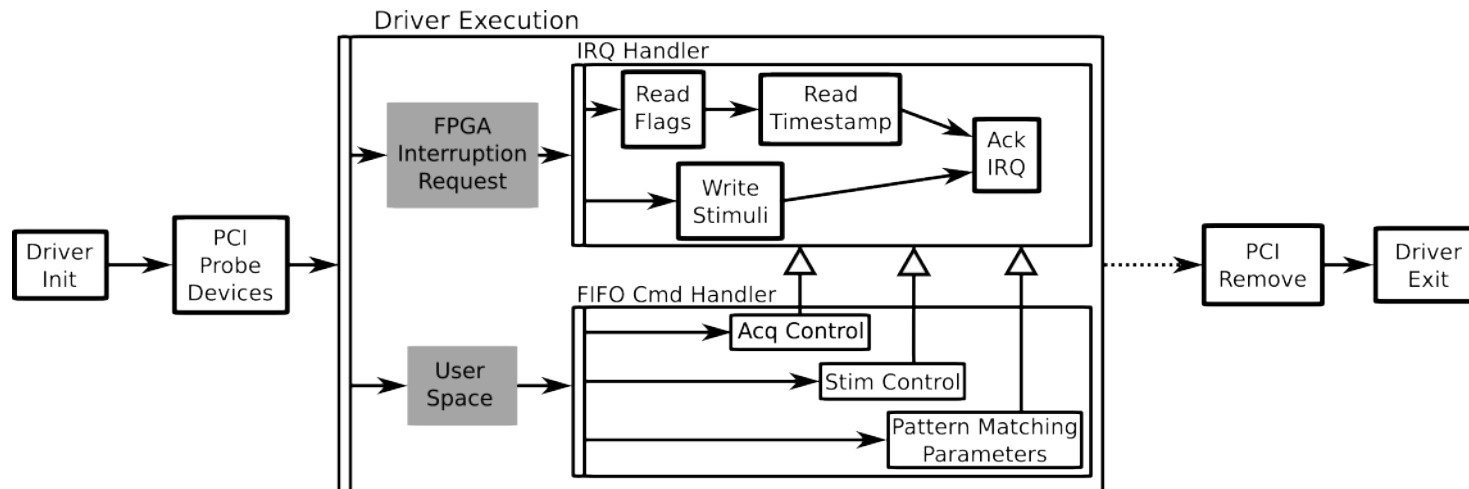
FPGA Altera Cyclone IV



FPGA Altera Cyclone IV



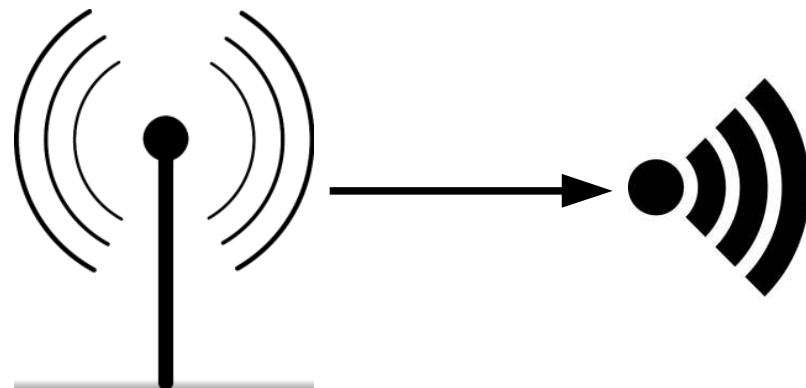
RTAI Kernel Module



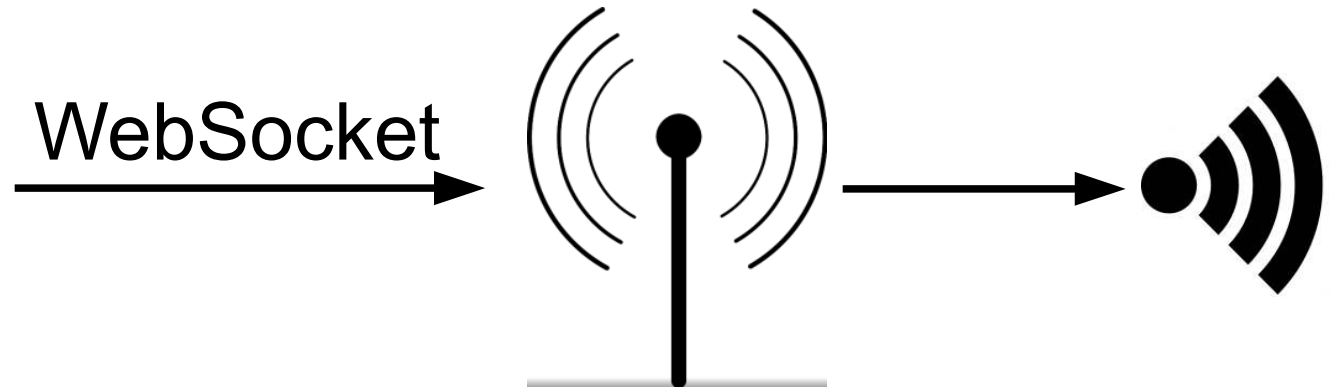
User Space - Server



WebSocket



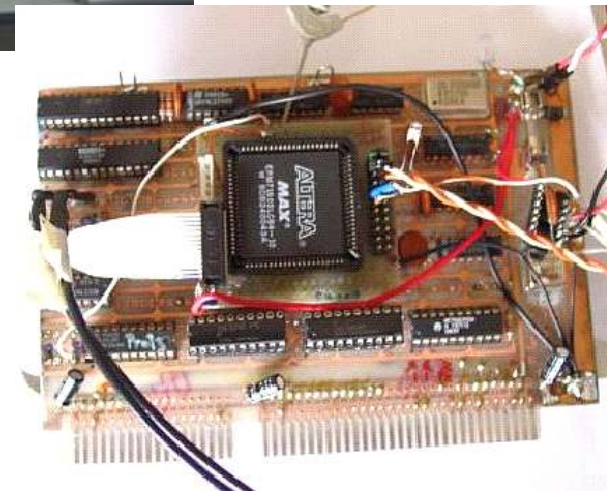
User Space - Server



User Space - Client



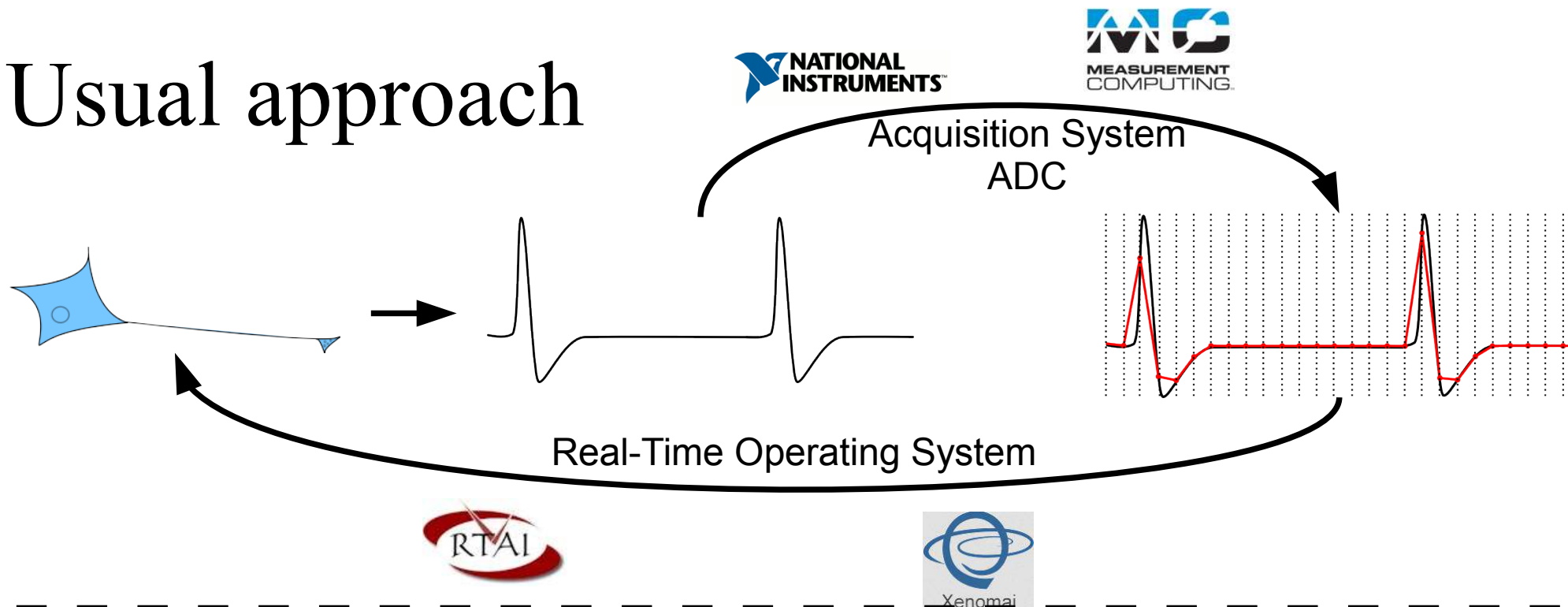
Our laboratory



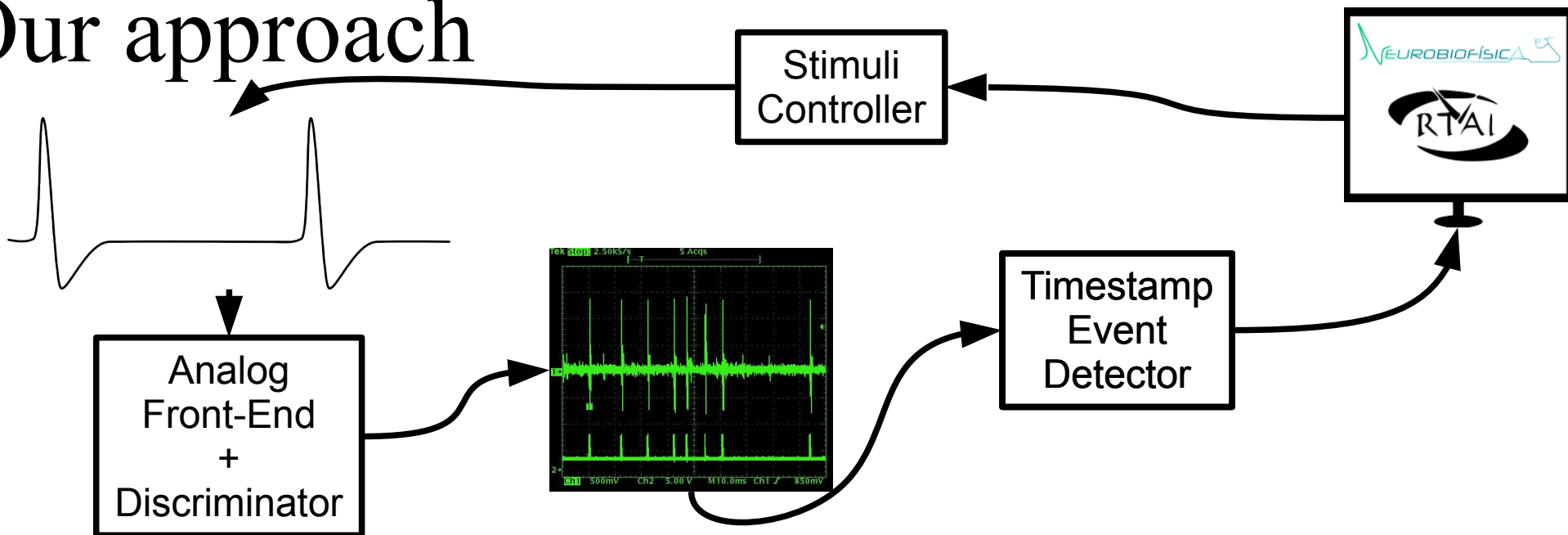
Our laboratory



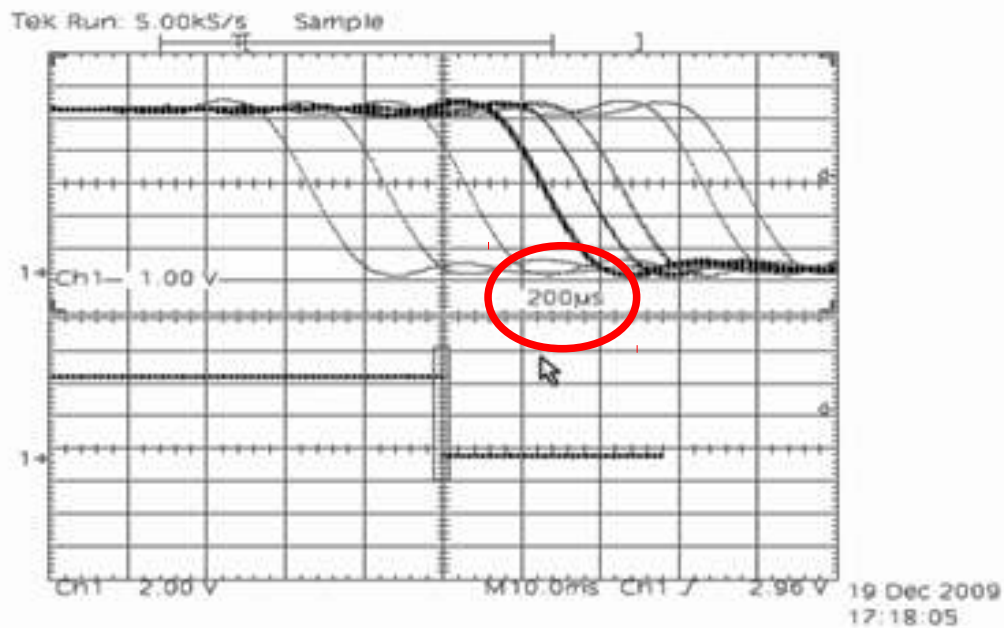
Usual approach



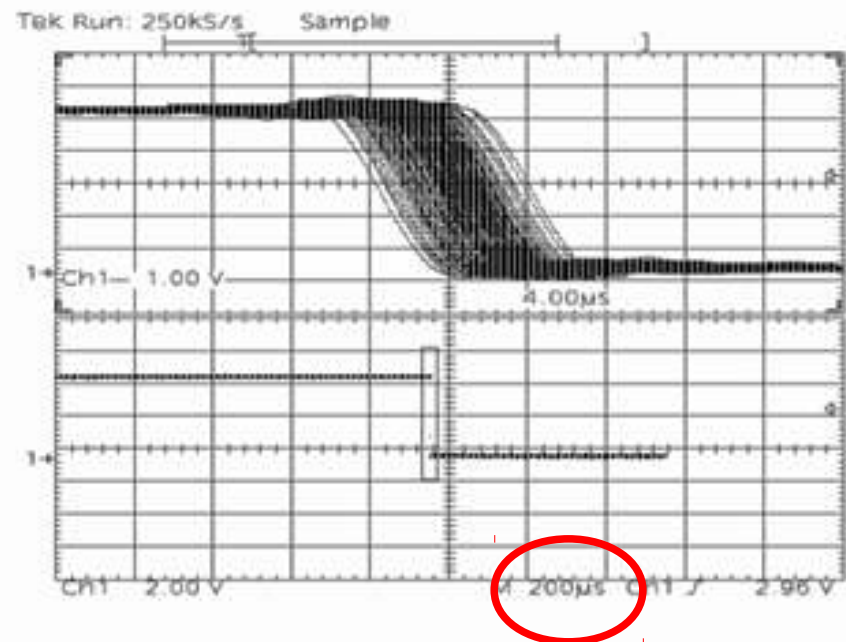
Our approach



Why RTOS?

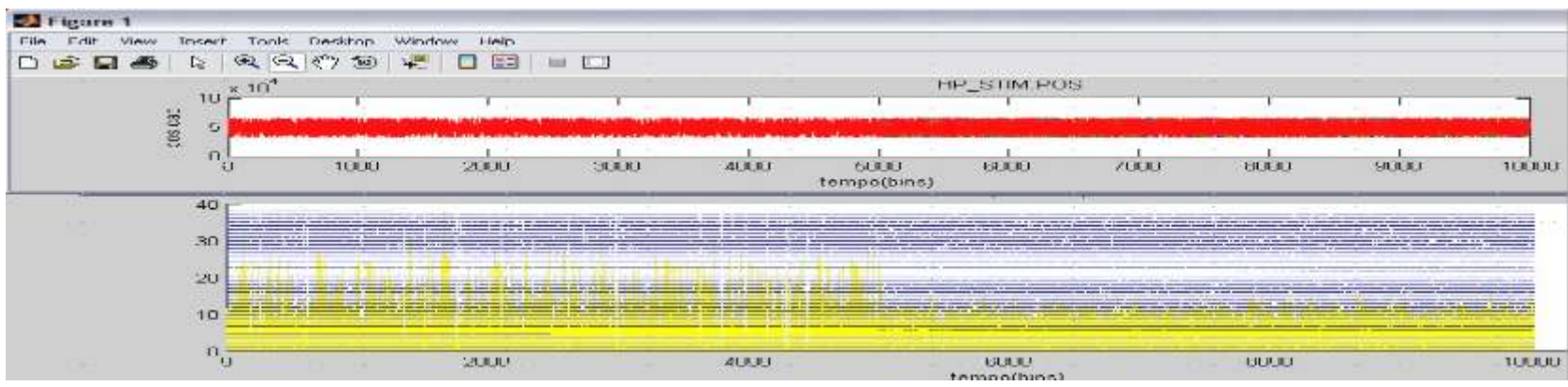
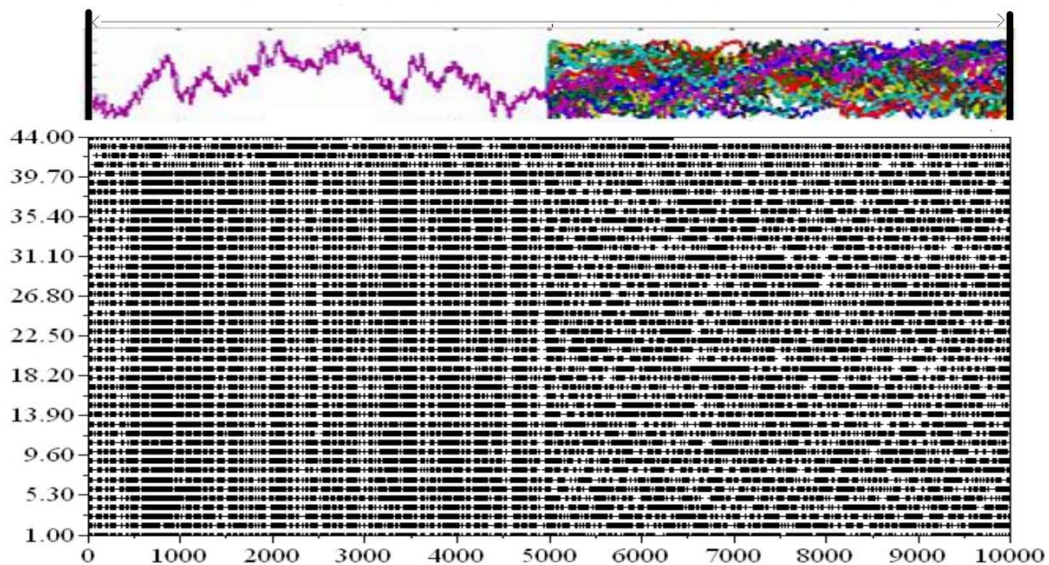


(a) Sinal gerado com Linux

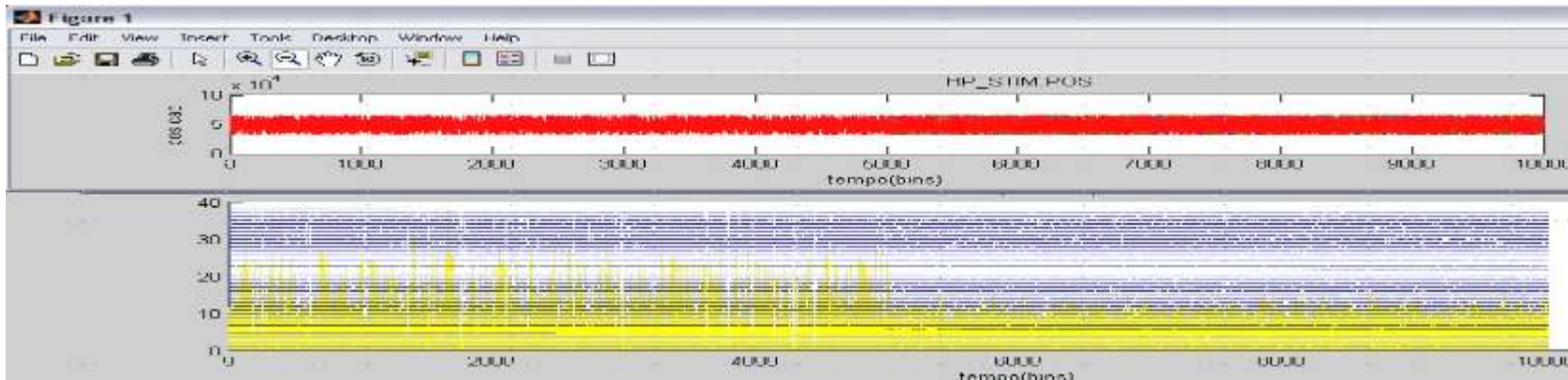


(b) Sinal gerado com Linux-RTAI

Word Finder



Word Finder



Periodic Signal of 500ms
Each 10s, a specific word is generated

Video