NEUROPRO
NEUROVIS

Visualising brain signals
in 3D in real-time•

neuropro.ch/neurovis

About NeuroVIS

NeuroVIS is a real-time data analysis and visualisation engine optimised for biosensory and neuroscience applications.

Key features

- 3D visualisation of EEG data and derived variables from upto 75 channels

- Synchronised video

- ECG monitoring and heart rate visualisation

- Multiple data inputs: Local storage, NeuroPro's data cloud (VMLpro), Bluetooth, Bluetooth LE

- Hardware agnostic real-time communication with EEG devices: NeuroTrail, Muse, OpenBCI, IMEC headsets

- Highly customisable layout and interface

- Multiple 3D visualisation modes

- Montages / rereferencing

- Spectral analyses

- Neurofeedback: Dual monitor support for independent therapist and patient screens, audio and visual reward presentation, frequency band threshold setting

EEG and ECG (electroencephalography and electrocardiography) is visualised either through heat maps projected onto models of the cortical surface for EEG or via simulation of physical function in the case of ECG. Data visualisation produces fully interactive and animated 3D displays of spatially distributed time-series data facilitating intuitive interpretation of complex phenomena.

NeuroVIS integrates seamlessly with our SaaS applications (VMLpro) and hardware (NeuroTrail) to allow instant analysis, visualisation and streaming of captured EEG data enabling remote EEG applications such as telemonitoring and neurofeedback in real-time from any location.
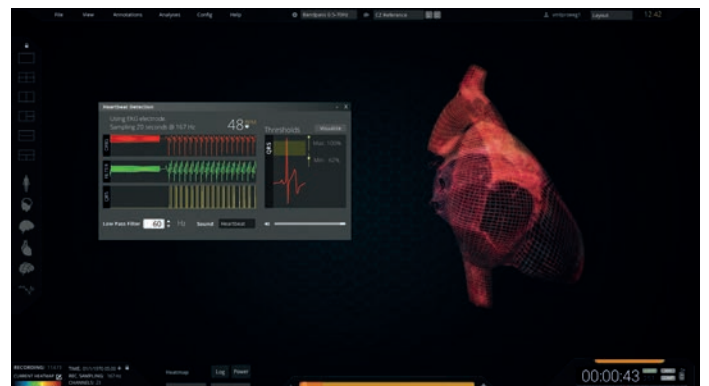

Real-time spectral analyses and re-montaging

Whole body avatar and transparent meshes
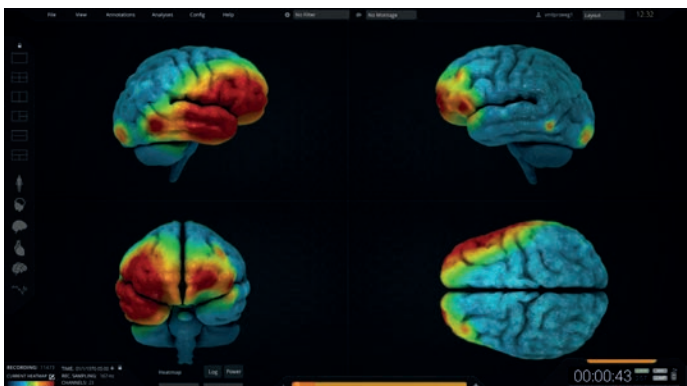
EEG visualisation on cortical model

ECG visualisation on an animated heart model

> *NeuroPro is unique in that they are developing some* ***new*** *and* ***very powerful*** *and visual solutions.*

Prof Sean Hill
Co-Director of the Blue Brain Project and Co-Director
of Neuroinformatics at the Human Brain Project

Technology

NeuroVIS is the first software platform to exploit Unity's extensive and powerful programming environment for use in biosensory and neuroscientific applications. Ostensibly a gaming engine, Unity takes advantage of the computational power of the graphical processing unit (GPU) thus greatly improving processing speed for real-time analytics and data visualisation. Streaming data from local files, the cloud or connected headsets improves memory usage and computational performance.

Latency in transforming data streams into visualisations, be they literal or abstract, is critical in many applied neuroscience paradigms. Real-time feedback based on biosensor input is crucial for facilitating the conditioning that underpins bio- and neuro-feedback applications, spanning guided meditation to ADHD therapy. Thus, NeuroVIS's optimisation for real-time processing enables advanced neuroscience applications.

Applications

- Body sensor research
- Neuromonitoring
- Biofeedback
- Neurofeedback
- Patient led research
- Neuromarketing
- Cognitive brain training
- Guided meditation

Neurofeedback application
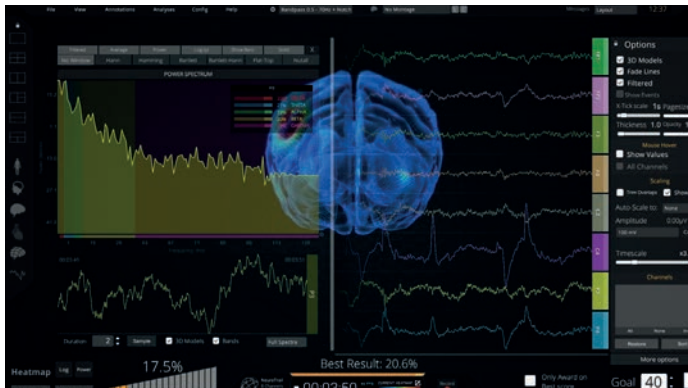
Therapist screen: Full EEG display and visualisation, real-time spectral analyses and threshold setting for frequency band neurofeedback (data collected with NeuroTrail)
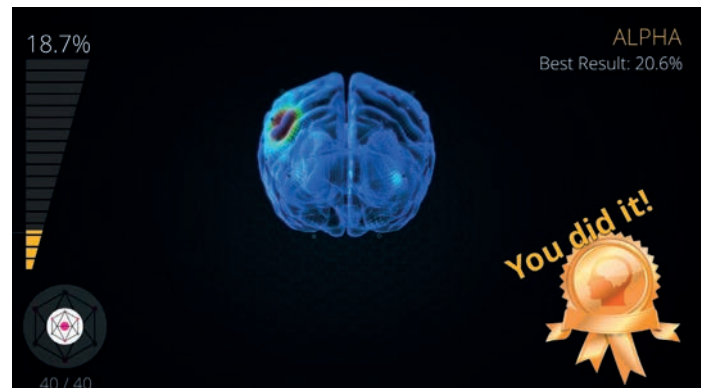
Participant screen: EEG visualisation and frequency band power monitor for visual feedback. Audio and visual rewards are displayed for achieving the threshold set in the therapist screen

Ongoing projects

- Participant initiated bio- and neuro- feedback for the management of PTSD
- Cognitive brain training for the proactive prevention of cognitive decline with advancing age
- Neurofeedback for the cognitive deficits associated with chemotherapy treatment in cancer survivors
- Stress management for workplace wellness
- Visualisation of brain dynamics in coma and non-convulsive status epilepticus

NEURO•PRO

Who we are

NeuroPro incorporates specialists from the fields of computer science, neurophysiology, bioengineering, and product and user-interface design. This combination of skills allows us to adopt an informed inter-disciplinary approach to the specific challenges facing those working in brain science.

Our tools for monitoring and analysing brain activity will contribute to accelerating brain research by supporting researchers, clinicians and innovators in pushing the boundaries of brain science and its applications.

Our tools provide an advanced platform for the development of a wide range of health and wellness applications from supporting the development of brain observatories to remote telemonitoring, patient led research, neurofeedback and cognitive wellness. Additionally, NeuroPro's tools are relevant to innovative entertainment, lifestyle and interaction solutions driven by brain computer interface technologies.

Contact us

Partnership is a key element in the way we work. We collaborate with globaal leaders in the design, development and implementation of our products and welcome new collaborations.

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