WHOLE-HEAD NEUROIMAGING

fNIRS + EEG

HIGH-DENSITY • BIMODALITY
MOBILITY • FLEXI-MODULARITY

INTEGRATES WITH VIRTUAL REALITY

BIOPAC Systems, Inc.

MedeOpt™

WWW.BIOPAC.COM

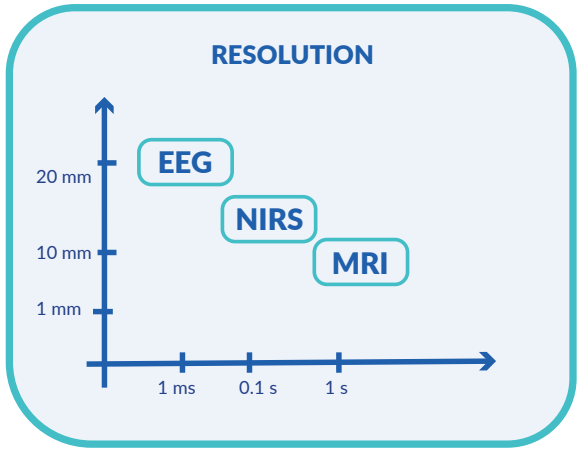
APPLICATIONS

- Cognitive Neuroscience
- Sports Sciences
- Virtual Reality
- Mobility Studies
- Language
- Auditory
- Social Interactions
- Hyperscanning
- Epilepsy
- Deep Brain Stimulation (DBS)
- Vagal Nerve Stimulation (VNS)

The fNIRS + EEG Advantage

MedelOpt measures hemodynamic response simultaneously with electric potentials

Functional near-infrared spectroscopy (fNIRS) measures changes in oxygenation and hemodynamic response while EEG signals measure electrical neuronal activity. The spatial resolution of fNIRS is superior to EEG, and the temporal resolution of EEG is superior to fNIRS. MedelOpt combines the advantages of both signals.

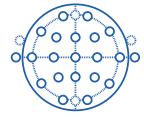


Researchers can now simultaneously collect neural and vascular brain activity in a flexible, adaptable headset. MedelOpt provides accurate measurements for in-vivo 2D/3D functional brain mapping.

Features

NIRS Technology
Continuous Wave

Sampling Frequency
128 Hz on detectors, up to 32 Hz for emitters



Electroencephalogram
8 Ag/AgCl electrodes with 512 Hz sampling frequency

Channel Distances
Flexible up to 55 mm

One Headset
Fits 4-year-old to adult

MedelOpt Breakthrough Technology for Brain Researchers

Direct Access to the Scalp

Unique headset design allows easy access to the scalp to move hair from under optodes without removing the optodes

Modular, Expandable Headset

Flexible sensor placement, NIRS and EEG can be set up to record the whole head from the cognitive to the visual area

Crafted for Wearability

Lightweight, comfortable, and easy to adjust system allows data acquisition from stationary or mobile participants

Integrate MedelOpt with Physiological Data from BIOPAC Devices

MedelOpt fNIRS and EEG systems combine high-density NIRS with EEG in a flexible, adaptable headset. Developed by researchers for researchers, MedelOpt offers a variety of options to use in the lab, in the field, and in virtual reality.

The headset is flexible, modular, and adapts to the size of the person's head as well as the study. Start with a 64-channel NIRS system and add NIRS and EEG as your study grows. Headsets can collect data for up to eight hours. MedelOpt systems can be adapted from EEG/fNIRS modality to hyperscanning to support a range of interests and budgets.

MedelOpt Virtual Reality (VR)

SHOWN WITH META QUEST 2

MedelOpt VR integrates seamlessly with BIOPAC's VR systems including head-mounted displays, motion-tracking, and software.

Combining VR with fNIRS and/or EEG allows researchers to measure brain activity in response to simulated environments, providing insights into how the brain processes and reacts to different stimuli. Researchers can study the effects of VR on cortical regions, e.g. Motor Cortex, SMA, and DLPFC.

Talk to a BIOPAC specialist about VR solutions for Vizard and Unity.

MedelOpt fNIRS with EEG

MedelOpt research devices provide full integration of functional near-infrared spectroscopy and electroencephalogram in a single headset. The unique design blends bimodality and flexi-modularity in an adaptable and self-contained system.

Functional Neuroimaging Systems

MedelOpt supports a wide range of research possibilities and provides access to the scalp without removing the headset. Adjust modular components for optimized fit and data collection. MedelOpt VR is fully integrated with a head-mounted VR device like Meta Quest 2 and others.

Direct Access to Scalp

MEDELOPT MOBILITY

Wireless with unlimited range for mobility and high-density mapping up to 128 channels

MEDELOPT INFINITY

16 emitters and 32 detectors for whole-brain mapping up to 512 channels and custom advanced montages with variable depths

No Cap Needed

MEDELOPT TANDEM

Simultaneous acquisitions for brain synchronization with high-density hyperscanning 256 to 1024 channels with two headsets

MEDELOPT VR

Combine fNIRS, EEG, VR, and Physiology for both cognitive and physiological insights using immersive stimuli

Seenel Imaging Technology

Protected by International Patent Applications

MedelOpt System Specifications

System Type	Part #	Emitters/ Detectors	EEG	Wireless	Short Channel	Use Cases
MOBILITY 	MOBIL 8-8	8/8	No	Yes	Up to 8	MedelOpt Mobility is lightweight and easy to use. Researchers can study brain function in real-world settings with natural movement such as walking, running, etc.
	MOBIL 8-8-EEG	8/8	Yes	Yes	Up to 8	
	MOBIL 8-16-EEG	8/16	Yes	Yes	Up to 8	
VR 	VR-8-8	8/8	No	Yes	Up to 8	Combining VR with MedelOpt allows researchers to measure brain activity in simulated environments, providing insights into how the brain processes and reacts to different stimuli.
	VR-8-8-EEG	8/8	Yes	Yes	Up to 8	
INFINITY 	INFIN 16-16	16/16	No	Optional	Up to 16	High-density whole brain mapping and custom advanced montages with variable depths. Researchers can pinpoint specific brain regions involved in a task or stimulus.
	INFIN 16-16-EEG	16/16	Yes	Optional	Up to 16	
	INFIN 16-32-EEG	16/32	Yes	Optional	Up to 16	
TANDEM 	TAND 8-8	8/8 per headset	No	No	Up to 4 per headset	Two headsets synchronize acquisitions and hyperscanning to investigate the neural mechanisms underlying social interactions, empathy, cooperation, and conflict.
	TAND 8-16	8/16 per headset	No	No	Up to 4 per headset	

Seenel Imaging Technology

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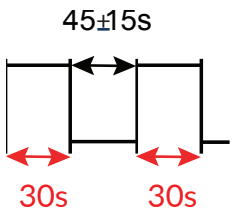
Dual Task: Treadmill + Countdown

Walking (Velocity: 4 km/hour)
Counting back by 7 while walking

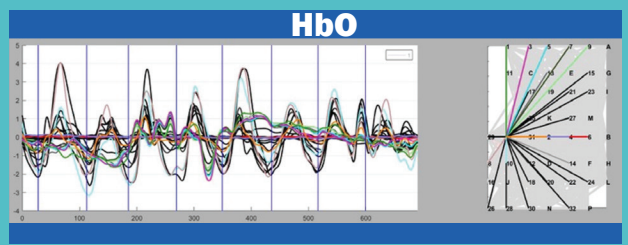
The inherent mobility of MedelOpt allows researchers to quantify how the brain is functionally involved in gait control during walking.

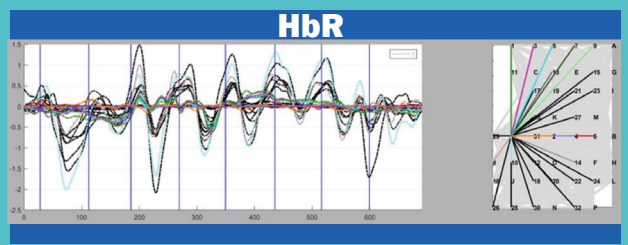
Recent studies using fNIRS, a noninvasive optics-based neuroimaging modality, shed light on the functional brain correlates of walking.

12 blocks
Baseline: 30 sec
Task: 30 secs
Rest: 45 + x seconds,
with x = a random number [-15,15]



Channels from One Source in Motor Cortex





MedelOpt systems are designed to support a range of settings and can be expanded as needed. Works with ElOpt software and Acq*Knowledge* software.

Montages

Design the best high-density montage for your studies

Distances

From 20 to 55 mm, choose channel distance and depth

Calibration

Control your calibration

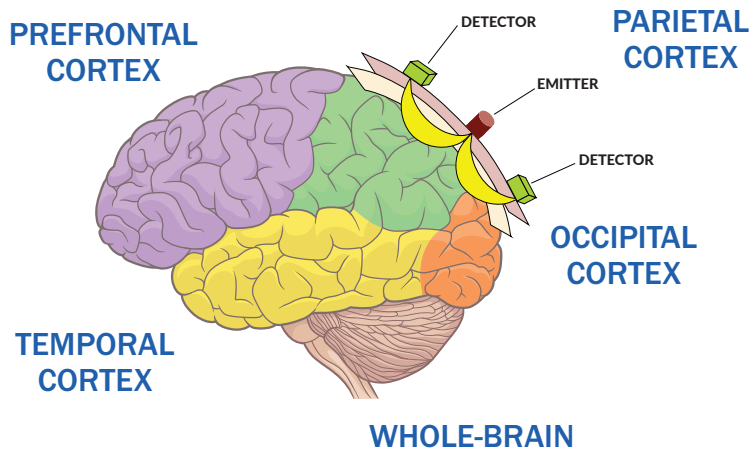
Head Sizes

One headset adjusts to all sizes: 4-year-old to adult

Integrated Optodes

The optodes are integrated into the headset, making it very easy for the researcher to use

Measurement Areas



Inspiring People and
Enabling Discovery
About Life

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