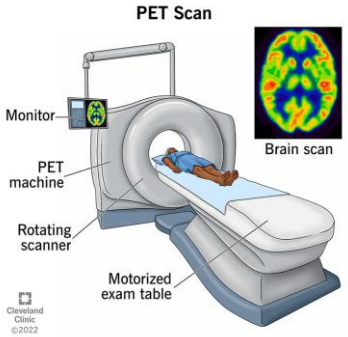
Bridging the gap – Best practices in mobile brain imaging

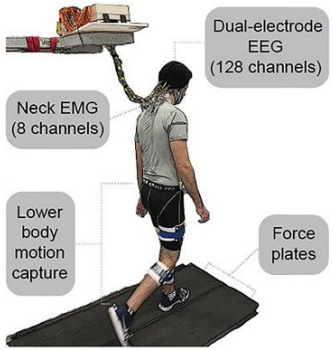
Radboudumc

Program

- Introduction
- EEG, fNIRS & Multimodal setups
- Data collection: separate EEG & fNIRS tracks
- Data (pre-)processing
- Plenary wrap-up

Neuroimaging of gait and balance



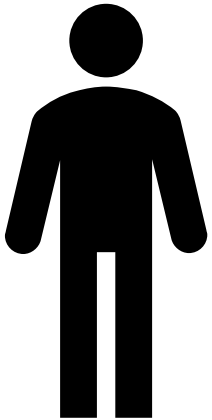


1980 1990 2000 2010 2020

MoBI: level of experience?

None

Taking first steps



Paper published

First article on EEG during gait:

"Cerebral evoked potentials associated with the compensatory reactions following stance and gait perturbation"

WHEN?

Already in 1984!

Neuroscience Letters, 50 (1984) 181–186
Elsevier Scientific Publishers Ireland Ltd.

NSL 02922

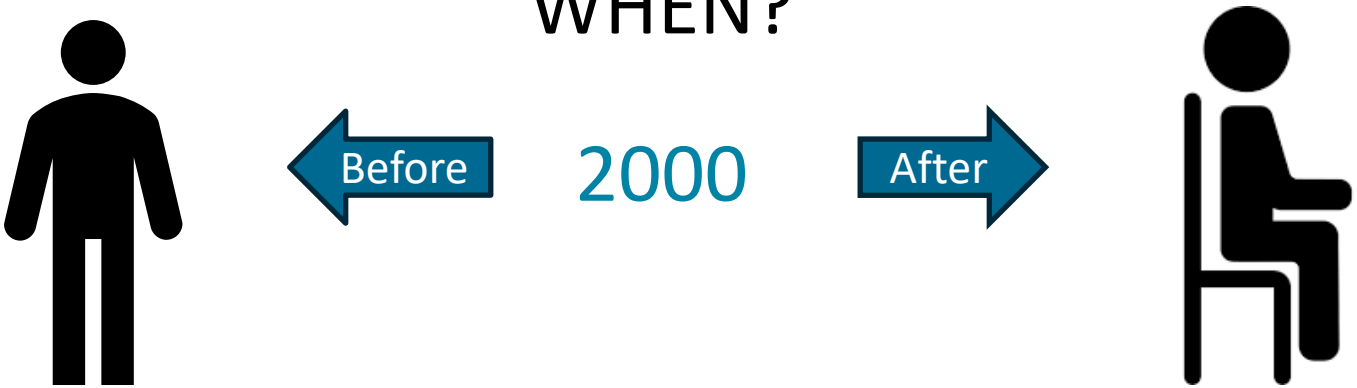
CEREBRAL EVOKED POTENTIALS ASSOCIATED WITH THE COMPENSATORY REACTIONS FOLLOWING STANCE AND GAIT PERTURBATION

V. DIETZ, J. QUINTERN and W. BERGER

First article on fNIRS during gait:

"Cortical mapping of gait in humans: a near-infrared spectroscopic topography study"

WHEN?



First in 2001

NeuroImage **14**, 1186–1192 (2001)
doi:10.1006/nimg.2001.0905, available online at http://www.idealibrary.com on IDEAL®

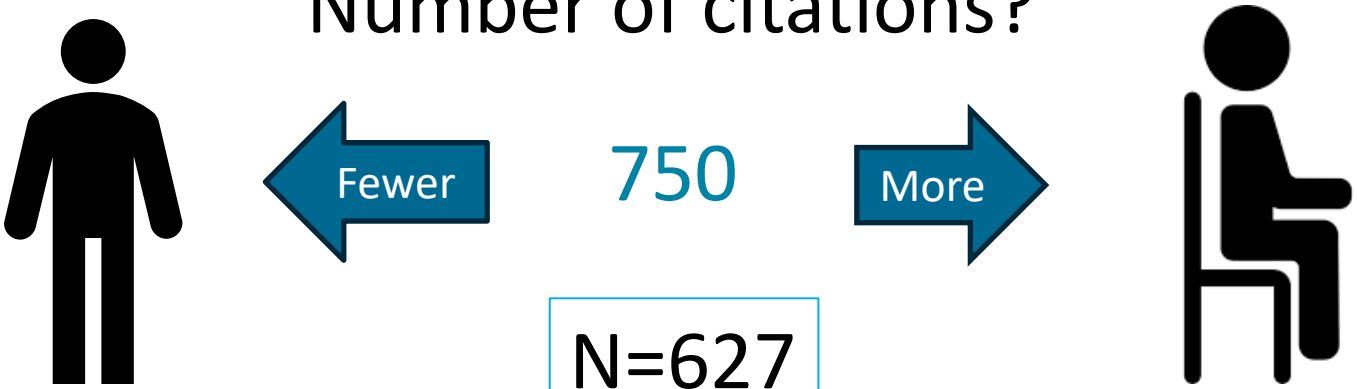
Cortical Mapping of Gait in Humans: A Near-Infrared Spectroscopic Topography Study

Ichiro Miyai,* Hiroki C. Tanabe,† Ichiro Sase,† Hideo Eda,† Ichiro Oda,‡ Ikuo Konishi,‡ Yoshio Tsunazawa,‡ Tsunehiko Suzuki,* Toshio Yanagida,†§ and Kisou Kubota*¶

Most highly cited paper on EEG during gait:

"Removal of Movement Artifact From High-Density EEG Recorded During Walking and Running"

Number of citations?



N=627

"Removal of Movement Artifact From High-Density EEG Recorded During Walking and Running"

Authors?

Innovative Methodology

J Neurophysiol 103: 3526–3534, 2010.
First published April 21, 2010; doi:10.1152/jn.00105.2010.

Removal of Movement Artifact From High-Density EEG Recorded During Walking and Running

Joseph T. Gwin,[1] Klaus Gramann,[2] Scott Makeig,[2] and Daniel P. Ferris[1]

[1]*Human Neuromechanics Laboratory, School of Kinesiology; University of Michigan, Ann Arbor, Michigan; and* [2]*Swartz Center for Computational Neuroscience, Institute for Neural Computation; University of California, La Jolla, California*

Learning objectives

1. What are EEG and fNIRS and where are they different?
2. How can I setup a MOBI study?
3. Why is the (pre)-processing of the neural data so tricky?
4. Who will I contact if I want to bridge the gap?