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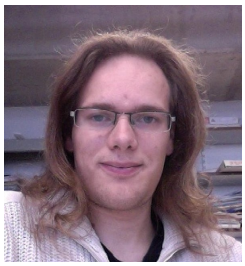

Artistic and research interests

I'm a neuroscientist, studying the human brain. Through advanced data analysis of brain imaging data (EEG, MEG, fMRI) I try to understand how our brain performs complex cognitive tasks. Currently, my research focuses on language comprehension: "how does our brain recognize speech, words and pictures in an instant?"
Most of the time, I'm working on problems in the form of "extract evidence of process X happening in the brain from signal Y". Preferably, "process X" is something concrete that we are pretty sure must be happening and "signal Y" is data collected during a well thought-out experiment designed to elicit the process. My analysis methods currently include many types of linear models (multivariate regression, SVMs, beamformers, etc.), representational similarity analysis (RSA) and functional connectivity analysis.
As a proponent of open science, I always strive to publish my analysis pipelines, as well as contribute to various larger open source efforts, such as MNE-Python.
Research Group: Department of Neuroimaging and Biomedical Engineering: Imaging Language
List of publications and other research outputs: Aalto Research portal
Elsewhere:

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ResearchGate

Qualifications

Doctor of Philosophy in Natural Sciences

Research output

MNE-RSA: Representational similarity analysis using MNE-Python datastructures
van Vliet, M., 21 Apr 2020

Seven quick tips for analysis scripts in neuroimaging
van Vliet, M., 1 Mar 2020, In : PLoS computational biology. 16, 3, p. 1-10 10 p., e1007358.

Post-hoc modification of linear models: combining machine learning with domain information to make solid inferences from noisy data
van Vliet, M. & Salmelin, R., 26 Sep 2019, In : NeuroImage. 204, p. 1-14 116221.

Reconstructing meaning from bits of information
Kivisaari, S. L., van Vliet, M., Hultén, A., Lindh-Knuutila, T., Faisal, A. & Salmelin, R., 25 Feb 2019, In : Nature Communications. 10, 1, p. 1-11 11 p., 927.

Post-Hoc Modification of Linear Models
van Vliet, M., 11 Jan 2019

Analysis of functional connectivity and oscillatory power using DICS: From raw MEG data to group-level statistics in Python

van Vliet, M., Liljeström, M., Aro, S., Salmelin, R. & Kujala, J., 11 Aug 2018, In : Frontiers in Neuroscience. 12, p. 1-17 17 p., 586.

Exploring the Organization of Semantic Memory through Unsupervised Analysis of Event-related Potentials
van Vliet, M., Van Hulle, M. & Salmelin, R., Mar 2018, In : Journal of Cognitive Neuroscience. 30, 3, p. 381-392 12 p.

Conpy: a Python module for spectral power mapping and functional connectivity analysis using DICS
van Vliet, M., 19 Jan 2018

How does the brain process mild versus strong violations in music? A pilot study using event-related potentials
Joret, M. E., van Vliet, M., Camarrone, F. & Van Hulle, M. M., 3 Nov 2017, *2017 22nd International Conference on Digital Signal Processing, DSP 2017.* IEEE, 5 p. 8096146. (International Conference on Digital Signal Processing proceedings).

Single-trial ERP component analysis using a spatiotemporal LCMV beamformer
Van Vliet, M., Chumerin, N., De Deyne, S., Wiersema, J. R., Fias, W., Storms, G. & Van Hulle, M. M., 1 Jan 2016, In : IEEE Transactions on Biomedical Engineering. 63, 1, p. 55-66 12 p., 2468588.

Response-related potentials during semantic priming: The effect of a speeded button response task on ERPs
Van Vliet, M., Manyakov, N. V., Storms, G., Fias, W., Wiersema, J. R. & Van Hulle, M. M., 6 Feb 2014, In : PloS one. 9, 2, e87650.

Amplitude of N400 component unaffected by lexical priming for moderately constraining sentences
Khachatryan, E., van Vliet, M., De Deyne, S., Storms, G., Manvelyan, H. & Van Hulle, M. M., 1 Jan 2014, *4th International Workshop on Cognitive Information Processing - Proceedings of CIP 2014.* 6844516

Steady-state visual evoked potential-based computer gaming on a consumer-grade EEG device
Chumerin, N., Manyakov, N. V., Van Vliet, M., Robben, A., Combaz, A. & Van Hulle, M. M., 1 Jul 2013, In : IEEE TRANSACTIONS ON COMPUTATIONAL INTELLIGENCE AND AI IN GAMES. 5, 2, p. 100-110 11 p., 6334432.

Sampled sinusoidal stimulation profile and multichannel fuzzy logic classification for monitor-based phase-coded SSVEP brain-computer interfacing
Manyakov, N. V., Chumerin, N., Robben, A., Combaz, A., Van Vliet, M. & Van Hulle, M. M., 1 Jun 2013, In : JOURNAL OF NEURAL ENGINEERING. 10, 3, 036011.

Steady state visual evoked potential based computer gaming - The maze
Chumerin, N., Manyakov, N. V., Combaz, A., Robben, A., van Vliet, M. & Van Hulle, M. M., 7 Nov 2012, *Intelligent Technologies for Interactive Entertainment - 4th International ICST Conference, INTETAIN 2011, Revised Selected Papers.* p. 28-37 10 p. (Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering; vol. 78 LNICST).

Designing a brain-computer interface controlled video-game using consumer grade EEG hardware
van Vliet, M., Robben, A., Chumerin, N., Manyakov, N. V., Combaz, A. & Van Hulle, M. M., 30 Jul 2012, *2012 ISSNIP Biosignals and Biorobotics Conference: Biosignals and Robotics for Better and Safer Living, BRC 2012.* 6222186

Decoding SSVEP responses based on PARAFAC decomposition
Manyakov, N. V., Chumerin, N., Combaz, A., Robben, A., van Vliet, M. & Van Hulle, M. M., 13 Jun 2012, *BIOSIGNALS 2012 - Proceedings of the International Conference on Bio-inspired Systems and Signal Processing.* p. 443-447 5 p.

Feasibility of error-related potential detection as novelty detection problem in P300 mind spelling
Manyakov, N. V., Combaz, A., Chumerin, N., Robben, A., van Vliet, M. & Van Hulle, M. M., 21 May 2012, *Artificial Intelligence and Soft Computing - 11th International Conference, ICAISC 2012, Proceedings.* PART 2 ed. p. 293-301 9 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 7268 LNAI, no. PART 2).

Combining object detection and brain computer interfacing: Towards a new way of subject-environment interaction
Robben, A., Chumerin, N., Manyakov, N. V., Combaz, A., van Vliet, M. & Van Hulle, M. M., 5 Dec 2011, *2011 IEEE International Workshop on Machine Learning for Signal Processing - Proceedings of MLSP 2011.* 6064548

Brain-computer interface research at Katholieke Universiteit Leuven
Manyakov, N. V., Chumerin, N., Combaz, A., Robben, A., van Vliet, M., De Mazière, P. A. & Van Hulle, M. M., 1 Dec 2011 , *Proceedings of the 4th International Symposium on Applied Sciences in Biomedical and Communication Technologies, ISABEL'11.*

Decoding phase-based information from steady-state visual evoked potentials with use of complex-valued neural network
Manyakov, N. V., Chumerin, N., Combaz, A., Robben, A., van Vliet, M. & Van Hulle, M. M., 26 Sep 2011, *Intelligent Data Engineering and Automated Learning, IDEAL 2011 - 12th International Conference, Proceedings.* p. 135-143 9 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 6936 LNCS).

Looking around with your brain in a virtual world
Bos, D. P. O., Duvinage, M., Oktay, O., Saa, J. D., Guruler, H., Istanbullu, A., van Vliet, M., Van De Laar, B., Poel, M., Roijendijk, L., Tonin, L., Bahramisharif, A. & Reuderink, B., 10 Aug 2011, *IEEE SSCI 2011 - Symposium Series on Computational Intelligence - CCMB 2011: 2011 IEEE Symposium on Computational Intelligence, Cognitive Algorithms, Mind, and Brain.* p. 106-113 8 p. 5952110

Opinion Elicitation in Second Life
van Vliet, M., Neviarouskaya, A. & Prendinger, H., 1 Dec 2009, *Intelligent Technologies for Interactive Entertainment - Third International Conference, INTETAIN 2009, Proceedings.* p. 252-257 6 p. (Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering; vol. 9 LNICST).

Projects

Moving from observation to understanding in neuroscience: extending computational models to predict neuroimaging data
van Vliet, M.
01/09/2017 → 28/02/2021