

# Dominik Welke

M.Sc.

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## Profile

cognitive neuroscience and biology ■ work on aesthetic preferences, creativity and insight ■ multimodal data acquisition and analysis: EEG, eye tracking, peripheral physiology, behavior ■ open science practice, contribution to FOSS research tools ■ tech and methods focus

## Education

- since 2018 **Ph.D. Candidate**, *Max-Planck-Institute for Empirical Aesthetics and TU Berlin*, Germany  
Preliminary Title: *"Neurophysiological studies of art perception – linking aesthetic valuation with creative inspiration, curiosity and insight"* (estimated defense: July 2023)  
Supervisor: Edward A. Vessel, PhD; Prof. Klaus Gramann; Prof. David Pöppel
- 2013–2016 **M.Sc. Biology**, *University of Freiburg*, Germany, *overall grade 1.8*  
Thesis on EEG decoding, Brain-Computer Interfacing, and Human–Robot Interaction: *"Watching Clumsy Robots – Correlates of High-Level Error Recognition in the Human EEG"*, *grade: 1.3*  
Supervisor: PD Tonio Ball; Prof. Carsten Mehring
- 2012–2013 **Research stay**, *University of Vienna*, Austria, –  
Courses and Internships in Biological Anthropology, Philosophy, and Earth Sciences
- 2009–2012 **B.Sc. Biology**, *University of Bonn*, Germany, *overall grade 1.7*  
Thesis on Functional Morphology and Biomimetics: *"On Water-uptake through the spine surface of Pelecyphora (Cactaceae) and related Genera"* (in German), *grade: 1.1*  
Supervisor: Prof. Wilhelm Barthlott; Prof. Dorothea Bartels

## Previous Academic Positions

- 11/2017 **Research fellow**, *Dept. of Neuroscience*, Max-Planck-Institute for Empirical Aesthetics  
–04/2023 With: Edward A. Vessel, [VisNA Lab](#); Prof. David Pöppel, Director
- 04/2016 **Research fellow**, *DFG cluster of excellence "BrainLinks–BrainTools"*, University of Freiburg  
–03/2017 Thesis on Fostering interdisciplinary exchange between researchers, editorial service, public outreach  
With: PD Oliver Müller, AG Norms & Nature; PD Tonio Ball, [Neuromedical AI Lab](#)
- 02/2012 **Research Assistant**, *NEES Institute for Biodiversity of Plants*, University of Bonn  
–06/2012 Function: Electron– and 3D–microscopy of functional plant surfaces  
With: Prof. Wilhelm Barthlott, Biodiversity and Biomimetics Group

## Computer and Tech Skills

- Code **Python** (very experienced), **Matlab** (experienced), **R** (intermediate), **Julia** (basic), **LaTeX** (experienced)
- Tools **Git** (experienced), **HPC/slurm** (experienced), **LSL** (intermediate)  
parametric and non-parametric statistics, mixed models, machine learning/decoding  
open science, preregistration, fully automatic preprocessing pipelines, reproducibility

## Scholarships and Prizes

- 2023 **Credibility in Neuroscience Team Award**, *British Neuroscience Association*  
with [#EEGManyLabs](#)
- 2022 **New Developers Code Sprint**, *MNE-Python*  
Project: Supporting eye tracking data in MNE Python
- 2022 **Student Travel Award**, *International Association for Empirical Aesthetics (IAEA)*
- previous 2017 German-French Youth Organisation (DFJW/OFAJ); 2015 "Störung/HaFraAh" project, German Federal Cultural Foundation and German-Israeli Future Forum Foundation; 2015 "LivingFuture", German-Israeli Future Forum Foundation; 2013 "GoEast" program, German Academic Exchange Service (DAAD); 2012 "Praktikum für die Umwelt", Natural National Landscapes Germany and Commerzbank AG; 2012 Erasmus program

## Peer Reviewed Publications

All my publications are freely available (as Preprint or OpenAccess publication).

- [1] **Welke, D.**, & Vessel, E. A. (2022). Naturalistic viewing conditions can increase task engagement and aesthetic preference but have only minimal impact on EEG quality. *NeuroImage*, 256:119218, [doi:10.1016/j.neuroimage.2022.119218](#)
- [2] Strijbosch, W., Vessel, E. A., **Welke, D.**, Mitas, O., Gelissen, J., & Bastiaansen, M. (2021). On the Neuronal Dynamics of Aesthetic Experience: Evidence from Electroencephalographic Oscillatory Dynamics. *Journal of Cognitive Neuroscience*, 34(3):461–479, [doi:10.1162/jocn\\_a\\_01812](#)
- [3] **Welke, D.**, Purton, I., & Vessel, E. A. (2021). Inspired by art: Higher aesthetic appeal elicits increased felt inspiration in a creative writing task. *Psychology of Aesthetics, Creativity, and the Arts*, Advance online publication, [doi:10.1037/aca0000393](#)
- [4] **Welke, D.**, Behncke, J., Hader, M., Schirmmeister, R. T., Schönau, A., Eßmann, B., Müller, O., Burgard, W., & Ball, T. (2017). Brain Responses During Robot-Error Observation. *Kognitive Systeme Journal*, [doi:10.17185/duerpublico/44533](#)

### Group Publications

- [5] Pavlov, Y. G., Adamian, N., ..., **Welke, D.**, ..., Zakharov, I., & Mushtaq, F. (2021). [#EEGManyLabs](#): Investigating the replicability of influential EEG experiments. *Cortex*, 144:213–229, [doi:10.1016/j.cortex.2021.03.013](#)
- [6] Appelhoff, S., Sanderson, M., ..., **Welke, D.**, ..., Gramfort, A., & Jas, M. (2019). MNE-BIDS: Organizing electrophysiological data into the BIDS format and facilitating their analysis. *Journal of Open Source Software*, 4(44):1896, [doi:10.21105/joss.01896](#)

## Talks and Conferences

I have been personally invited for 4 standalone talks or panels, and I gave 7 talks and 7 poster presentations at scientific conferences.

### Invited Talks and Panels

- 2022 **Pelli Lab, New York University (NYU)**, *New York City*  
Title: "Using EEG to Study Visual Aesthetic Valuation"
- 2021 **Offspace "Moltkerei"**, *Cologne*  
Talk at the Exhibition Opening of "Janosch Jauch – Simulacrum"
- 2019 **PORT25, Mannheim**  
Panel discussion on Neuroscience and Art
- 2019 **Kolumba Museum, Cologne**  
Title: "Measuring Aesthetic Experiences"
- 2016 **Literaturbüro Freiburg, Freiburg**  
Host of a panel discussion on creativity in science

### Conference Talks

- 2022 **Int. Association of Empirical Aesthetics (IAEA) Meeting**, *Philadelphia*  
Title: "Using the 'Title-Effect' to evoke insight with Visual Art"
- 2022 **Society for the Neuroscience of Creativity (SfNC) Annual Meeting**, *Online*  
Title: "Using the 'Title-Effect' to evoke insight with Visual Art"
- 2022 **Cognitive Neuroscience Society (CNS) Annual Meeting**, *San Francisco*  
Title: "Naturalistic viewing conditions can increase task engagement and aesthetic preference but have only minimal impact on EEG quality"
- 2021 **Int. Association of Empirical Aesthetics (IAEA) meeting**, *Online*  
Title: "Relaxing experimental constraints increases aesthetic engagement but has only minimal impact on EEG signal-to-noise ratio"
- 2019 **Visual Science of Art Conference (VSAC)**, *Leuven*  
Title: "Designing an EEG paradigm for naturalistic engagement with aesthetic stimuli"
- 2018 **Int. Association of Empirical Aesthetics (IAEA) meeting**, *Toronto*  
Title: "Higher felt inspiration following aesthetically pleasing prompts in a creative writing task"
- 2017 **Cognitive Systems Workshop**, *Munich*  
Title: "Error-Related Brain Responses in Human-Robot-Interaction"

### Posters and Participation

CNS 2022; liveMEG 2020; SfNC 2020; OAmbassadors meeting 2020; CNS 2020; ECVP 2019; VSS 2019; cuttingEEG 2018; SfN 2016; BrainLinks-BrainTools Annual Meeting 2016; 3D Beyond Symposium 2016 at ZKM – Centre for Art and Media, Karlsruhe; Biomimetics Symposium 2012 at the Academy of Science and Literature, Mainz

## Other Professional Activities

I regularly contribute to **public code repositories** for open, reproducible research. Currently active in MNE-Python (e.g. I spearheaded analyses of steady-state data and support for eye tracker data); MNE-BIDS; AUTOMAGIC (e.g. better BIDS integration)

### Teaching and Supervision

- 2022 **M. Münzberg**. Electrophysiological Correlates of Aesthetically Moving Experiences – Time / Frequency Dynamics (BSc Thesis). BSc Psychology, GU Frankfurt

### Professional Service

- since 2019 **"Open Access Ambassador" Programme**, *Max-Planck-Society*
- since 2018 **Company first-aid**
- 01/2017 **Executive Board member**, *Etudes Sans Frontiers - Studies without Borders Germany e.V.*, *Officer for External Communication*  
–12/2017 Our student NGO awards scholarships to socially committed students in various international crisis regions to support sustainable development. Fundraising in Germany
- 2010–2012 **Elected member of the Student Council Biology**, *University of Bonn*  
2011–2012 as **vice president**

### Event Co-Organization

- Neuro-Aesthetics Social meetings** at VSS 2019 and CNS 2020
- 2019 **Workshop on MNE-Python**, *Max-Planck-Institute for Empirical Aesthetics*  
"Analyzing neurophysiological data with MNE Python" (by D. Engemann and J. Sassenhagen)
- 2018 **Visual Neuroaesthetics Symposium**, *Max-Planck-Institute for Empirical Aesthetics*

### Professional Membership

- active Frankfurt Open Science Initiative; International Association of Empirical Aesthetics (IAEA); Society for Neuroscience of Creativity (SfNC); Cognitive Neuroscience Society (CNS)
- dormant IEEE; Society for Neuroscience (SfN); Vision Science Society (VSS)

### Reviewer Activity

- Juries [Open Science Initiative Fellowship 2020 + 2021](#), University of Frankfurt
- Journals Journal of Vision; Psych. Research; Brain and Behavior; IEEE ICAR; Frontiers in Psychology; Cognition; JEP:General

### Public Outreach

- 2013–14 **Science Journalism and -Writing class**
- Dedicated projects:** 2019 "[Brain on Screen](#)" Project: German Filmmuseum, Frankfurt; 2016 [Brain-Writes-Sound](#), Performance at E-Werk Freiburg; 2016 Mentoring an Artist-in-Residency Project with novelist Annette Pehnt for University Freiburg and Theatre Freiburg; 2015 Art and Science Project "[Störung/HaFraAh](#)" on dance therapy in Parkinson's Disease
- Invited talks about neuroscience and art:** 2021 Offspace "[Moltkerei](#)" Cologne, 2019 PORT25 Mannheim, 2019 Kolumba Museum Cologne; 2016 Literaturbüro Freiburg