

Dr. Raphael Vallat

Sleep researcher / Algorithm engineer



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🔄 RaphaelVallat 🐦 RaphaelVallat

👤 PROFILE

I am a sleep researcher and lead ML data scientist in the Center for Human Sleep Science [↗](#) at UC Berkeley.

My research examines how sleep — or lack thereof — impacts human health and different human diseases. My work has been featured in several news media and podcasts (e.g. New York Times, Discover Magazine, This Is Your Brain).

I am also passionate about algorithm development and machine learning, particularly when applied to physiological time-series data (e.g. wearables, polysomnography, electrocardiogram).

🎓 EDUCATION

PhD in Neuroscience, *Université Claude Bernard Lyon 1* [↗](#)

2014 – 2017 | Lyon, France

My doctoral project aimed at understanding the neural correlates of dreaming, using simultaneous electroencephalography (EEG) and functional MRI.

Master in Neuroscience,

Université Claude Bernard Lyon 1 [↗](#)

2012 – 2014 | Lyon, France

Summa cum laude.

Bachelor in Cognitive Sciences,

Université Lumière Lyon 2 [↗](#)

2009 – 2012 | Lyon, France

Ranked 1st.

📁 WORK EXPERIENCE

Sleep advisor & algorithm developer, *Ōura* [↗](#)

2020 – present | San Francisco, USA

I joined Ōura in 2020 as a sleep scientist and algorithm developer. There, I have been co-leading the development of the next generation of sleep algorithms.

Postdoctoral researcher,

University of California, Berkeley [↗](#)

2018 – present | Berkeley, USA

My research with Prof. Matthew Walker [↗](#) focuses on the impact of sleep on human health. Recently, we have shown that the immune system mediates the association between poor sleep and cardiovascular disease. In current works, we are 1) developing novel sleep biomarkers of Alzheimer's disease, and 2) examining the causal influence of sleep on next-day metabolism (e.g. glucose regulation, triglycerides).

Open-source developer

2017 – present

I am the creator and core maintainer of several open-source softwares in Python, which are being used by thousands across the globe.

- Pingouin [↗](#) : general statistics (>200k downloads)
- YASA [↗](#) : sleep analysis and scoring
- Antropy [↗](#) : complexity of EEG time-series

Teaching [↗](#)

2014 – present

- Machine-learning in Python (graduate level) — *UC Berkeley*
- Supervision of several undergraduate and master students — *UC Berkeley*
- Neuroimaging (graduate level) — *Lyon University*
- Social science (medical school) — *Lyon University*
- Neurobiology (undergraduate level) — *Lyon University*

Peer-review

Reviewer for several high-impact scientific journals, including *Diabetologia*, *Journal of Neuroscience*, *JAMA*, *eLife*, and *Sleep*.

📄 SELECTED PUBLICATIONS

How people wake up is associated with previous night's sleep together with physical activity and food intake, *Nature Communications* (2022)

Vallat, Berry, ..., and Walker

Sleep loss leads to the withdrawal of human helping across individuals, groups, and large-scale societies, *PLoS Biology* (2022)

Ben Simon, Vallat, *et al.*

SKILLS

Software development

Python, R, Matlab, cloud computing, Git, Docker

Signal processing

Polysomnography (EEG, EOG, EMG, EKG), actigraphy, accelerometer, photoplethysmography (PPG), heart rate variability (HRV)

Data science

Machine-learning, statistical modeling, data processing and visualization

Academic research

Data collection (EEG, functional MRI, online survey, behavioral tasks), sleep scoring, team management, scientific writing, public speaking

AWARDS

Three-year PhD fellowship,

French Ministry of Higher Education and Research
2014

Two-year merit scholarship, French Ministry of Education

2012

LANGUAGES

French | English

REFERENCES

Pr. Matthew Walker, *Postdoc supervisor*,
University of California, Berkeley
mpwalker@berkeley.edu

Steven Kent, *Chief Product Officer*,
Know Labs (previously Head of Research Partnerships at
Ōura)
steventhomaskent@gmail.com

Dr. Perrine Ruby, *PhD supervisor*,
Université Claude Bernard Lyon 1
perrine.ruby@inserm.fr

Impact of insufficient sleep on dysregulated blood glucose control under standardised meal conditions, *Diabetologia* (2021) [↗](#)
Tsereteli, Vallat, et al.

An open-source, high-performance tool for automated sleep staging, *eLife* (2021) [↗](#)
Vallat and Walker

Broken sleep predicts hardened blood vessels, *PLoS Biology* (2020) [↗](#)
Vallat*, Shah*, Redline, Attia and Walker (*co-first authors)

Sleep loss and the socio-emotional brain, *TICS* (2020) [↗](#)
Ben Simon*, Vallat*, Barnes and Walker (*co-first authors)

Brain functional connectivity upon awakening from sleep predicts inter-individual differences in dream recall frequency, *SLEEP* (2020) [↗](#)
Vallat, Nicolas and Ruby

Hard to wake up? The cerebral correlates of sleep inertia assessed using combined behavioral, EEG and fMRI measures, *NeuroImage* (2019) [↗](#)
Vallat, Meunier, Nicolas, and Ruby

Visbrain: A multi-purpose GPU-accelerated open-source suite for multimodal brain data visualization, *Frontiers in Neuroinformatics* (2019) [↗](#)
Combrisson, Vallat, et al.

Pingouin: statistics in Python, *Journal of Open Source Software* (2018) [↗](#)
Vallat

Dream recall frequency is associated with medial prefrontal cortex white-matter density, *Frontiers in Psychology* (2018) [↗](#)
Vallat, Eichenlaub, Nicolas, and Ruby

Characteristics of the memory sources of dreams: a new version of the content-matching paradigm to take mundane and remote memories into account, *PLoS One* (2017) [↗](#)
Vallat, Chatard, Blagrove, and Ruby