

Mikkel Roald-Arbøl

Postdoctoral Researcher in Computational Ethology

Bonn, Germany

science@roald-arboel.com | roald-arboel.com | github.com/roalदारbol

Education

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| 2020 - 2025 | University of Sussex , Brighton, UK
<i>Ph.D. in Biology</i> |
| 2017 - 2019 | University of Copenhagen , Copenhagen, DK
<i>M.Sc. in Human Biology</i> |
| 2013 - 2016 | University of Copenhagen , Copenhagen, DK
<i>B.Sc. in Exercise and Sports Sciences</i> |

Experience

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| 11/2025 - Present | University of Bonn
<i>Advisor: Daniela Rößler</i>
I currently work on an experimental and computational pipeline to enable real-time behavioural segmentation, focusing on sleep stage segmentation in the jumping spider, <i>Portia fimbriata</i> . This work encompasses data collection methods, including electronics for closed-loop experiments, through data processing and behaviour segmentation. |
| 10/2020 - 2/2025 | University of Sussex
<i>Advisor: Jeremy Niven</i>
During my Ph.D. project, my main focus was on behavioural classification, individuality and respiration using the ground beetle <i>Nebria brevicollis</i> . |
| 10/2019 - 1/2020 | University of Copenhagen
<i>Advisor: Rune W. Berg</i>
During the internship, I developed a prototype for an open source operant conditioning chamber for rodents based on a single board computer (Raspberry Pi), programmable in Python. |
| 9/2018 - 8/2019 | University of Sussex
<i>Advisor: Jeremy Niven</i>
In my M.Sc. dissertation project, I investigated whether wood ants relied on visual clues, especially optical flow, to adjust their walking speed. As part of the project, I helped develop a virtual reality trackball system where we could experimentally manipulate the optical flow. |
| 1/2017 - 5/2017 | University of Queensland
<i>Advisor: Timothy Carroll</i>
Working as a research assistant, I helped on a host of projects. From developing an experimental setup for investigating the existence of express reaching movements (akin to express saccades), to pilot experiments aiming to test optimal control theory for perturbation during force application, and conducting experiments on force field adaptation. |
| 9/2016 - 12/2016 | University of Queensland
<i>Advisor: Luke Kelly</i>
As a research assistant, I worked on foot neuromechanics assisting with processing a large data set containing 3D bone models and X-ray scans, and pilot testing a setup that combined ultrasound imaging, force application and local anaesthetic to nerves in the lower limb. |
| 1/2015 - 6/2016 | University of Copenhagen
<i>Advisor: Jesper Lundbye-Jensen</i>
During my B.Sc., I did two projects with Jesper Lundbye. First, I investigated whether motor learning was accompanied by changes in excitability of the M1 cortical region. In the latter, I did |

a meta-analysis on single nucleotide polymorphisms (SNPs) associated with better learning and memory retention by combining genetic data with behavioural data from over 100 participants across multiple motor learning tasks.

Publications

1. Roald-Arbøl M, Yarwood E, David Fernandes AS, Moubarak EM, Drees C, Niven JE, Schuett W. 2025. Using a Low-Cost Trackball System to Assess Repeatability of Movement in Small Animals. *Ecology and Evolution* 15:e72535. DOI: <https://doi.org/10.1002/ece3.72535>
2. Geiger N, Hirschhorn C, Herberstein ME, Roald-Arbøl M, Rößler DC. 2025. Context-dependent abdomen bobbing in a jumping spider: a dynamic visual signal. *bioRxiv*. DOI: <https://doi.org/10.1101/2025.10.01.679781>
3. Verbinen, G., **Roald-Arbøl, M.**, Niven, J. E., & Nicholls, E. (2024). Shifts in honeybee worker metabolism immediately post-eclosion (p. 2024.12.01.622772). *bioRxiv*. DOI: <https://doi.org/10.1101/2024.12.01.622772>
4. Sobianin, I., Ngotho, S. G., Spector, M. B., **Roald-Arbøl, M.**, Vignal, E., Perineti, C. L., Ellison, L., Al Balush, S., Carriero, A., Eley, M., Cozan, M., Demirbatir, C., Dominiak, S. E., Janiak, F., Frazao, J., Maravall, M., Lagnado, L., Schröder, S., Kemenes, G., Baden T., Niven J. E., King S., Nowotny T., Chagas, A. M. (2025). BeeHive: A flexible open electronics platform for designing research equipment. *In prep*

Teaching

2024	<p>Mediterranean Ecology Field Course (827C1), University of Sussex <i>Professors:</i> Paul Graham and Valentina Scarponi At the field site in Arrifana, Portugal, I helped students with their ecology projects along the coast, both animal and plant, from the experimental design, transportation and how to carry out their data analysis.</p>
2021 - 2024	<p>Coastal Ecology Field Course (C7160), University of Sussex <i>Professor:</i> Claudia Drees Over multiple years I taught on this course at the Dale Fort in Pembrokeshire, Wales, covering all the main coastal ecosystems. I helped students with planning experimental designs and data analysis in R.</p>
2021 - 2023	<p>Research Foundations (828C1), University of Sussex <i>Professors:</i> Ane Timenes Laugen and Luc Bussière In this course, aimed at M.Sc. and Ph.D. students, I helped students during a full-time week focused on R and statistics, covering topics from basic data wrangling all the way to linear mixed effects models.</p>
2021 - 2022	<p>Research Methods in Biology, Ecology, Zoology (C1021), University of Sussex <i>Professor:</i> Wiebke Schuett I was a doctoral tutor on this first-year undergraduate course, helping students learn R and basic statistics during weekly practical sessions.</p>
2015 - 2016	<p>Athletics 1 & 2, University of Copenhagen <i>Professors:</i> Mikkel Sørensen and Birger Fisker I was a teaching assistant in athletics which covered multiple disciplines. This entailed both practical feedback during technical sessions as well as helping students in biomechanical analysis of various events.</p>

Scholarships & Awards

- 2023 | **Junior Scientist Workshop in Mechanistic Cognitive Neuroscience**, Janelia Research Campus
Highly competitive workshop that also covered all expenses, including flights and accommodation.
- 2023 | **Sussex Life Sciences Ph.D. Symposium: Best talk**, University of Sussex
For the Life Sciences Ph.D. Symposium, I presented work on sleep in insects; the presentation was supposed to be accessible and engaging to a non-specialist audience.
- 2023 | **Travel Grant**, The Association for the Study of Animal Behaviour
- 2023 | **Travel Grant**, Sussex Neuroscience PG Fund
- 2022 | **Sussex Doctoral Open Research Prize**, University of Sussex
This inaugural award was awarded to postgraduate researchers for an extraordinary effort in promoting open research practices. With the award came two months extra Ph.D. funding.
- 2019 | **Best Instrument, Art in Science Photo Competition**, University of Copenhagen
This scientific photography competition hosted by University of Copenhagen had multiple categories, and I won "Best Instrument" with my entry "Where to next?" which depicted a wood ant walking on a trackball. The picture can be found here: <https://artis.ku.dk/previous-contests/>.
- 2018 | **Travel Grants**, Erasmus+, Knud Højgaards Fond, Fam. Hede Nielsen Fond, Oticon Fonden
To be able to do my M.Sc. thesis at University of Sussex, I secured several competitive travel grants totalling 60.000DKK (~\$8700).