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Marvin Rainer Maechler, Ph.D.

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Summary

Computational neuroscientist studying how brains and computational models make systematic errors, like cognitive biases and illusions. 7+ years of experience solving complex problems, communicating data, and performing experiments. Passionate about using my skills to make the world better.

Skills

Programming	MATLAB, R, Python, Bash
Statistical analysis	hypothesis testing, regression, t-test, ANOVA, multilevel modelling, machine learning
Data collection	psychophysics, eye tracking, pupillometry, fMRI, A/B testing

Work Experience

Computational Neuroscientist at the University of Pennsylvania 2023 - present

- Designing and executing experiments investigating human decision-making and perceptual mechanisms, with a focus on explaining cognitive biases.
- Developing computational models of perception and decision making with the goal to explain irrational behaviors, and to reduce bias.
- Assessing the similarity of computational models to human brains and behavior using advanced statistical methods and custom analysis pipelines using Matlab, Python, and bash.
- Publishing research findings in peer-reviewed scientific journals and conference proceedings.
- Evaluating others' scientific papers as peer reviewer.
- Communicating findings to global audiences at national and international conferences.
- Supervising four graduate and undergraduate students in data collection and analysis methods.

Doctoral Researcher at Dartmouth College 2017 - 2023

- Designed and executed neuroimaging and behavioral experiments examining brain-behavior relationships. Lead three projects from ideation through publication.
- Published nine papers in peer-reviewed scientific journals (three as first-author).
- Presented findings at national and international conferences to diverse scientific communities.
- Served as a peer reviewer for scientific journals in the fields of psychology and neuroscience.
- Mentored more than ten undergraduate researchers in laboratory techniques and scientific methodology, including direct supervision of one senior honors thesis project from conception to completion.
- Provided instructional support for four undergraduate courses, review sessions and laboratory sections.

Research and Teaching Assistant at University of Regensburg 2016 - 2017

- Taught bi-weekly review section for large (> 200 people) lecture series. Administered, proctored, and graded exams.
- Collected data in behavioral and fMRI experiments.
- Prepared and presented 13 guest lectures for intro to Psychology classes.

Education

Ph.D. in Cognitive Neuroscience at **Dartmouth College** 2023
M.A. in Psychology at **Dartmouth College** 2020
B.Sc. in Psychology at the **University of Regensburg** 2017
Abitur at **Ludwigsgymnasium Munich** 2014

Awards & Prizes

William M. Smith Promise Award in Brain Science Research 2024
Marie A. Center Award for Excellence in Research 2022
Travel Award for the European Conference on Visual Perception 2019 in Leuven, Belgium 2019

Peer Reviewed Publications

* authors contributed equally

Lytchenko, T. K., **Maechler**, **M. R.**, Heller, N. H., Saleki, S., Tse, P. U., & Caplovitz, G. P. (2025). Invalid trials are not required to observe neural correlates of object-based attention in retinotopic visual cortex. *Journal of Cognitive Neuroscience*.

Maechler, **M. R.**, Choe, E., Kohler, P. J., Cavanagh, P., & Tse, P. U. (2025). Hemisphere specificity of attention response functions during attentional tracking. *Journal of Neuroscience*.

Cavanagh, P., Caplovitz, G. P., Lytchenko, T. K., **Maechler**, **M. R.**, Tse, P. U., & Sheinberg, D. (2023). The architecture of object-based attention. *Psychonomic Bulletin & Review*.

Frank*, S. M., **Maechler***, **M. R.**, Fogelson, S. V., & Tse, P. U. (2023). Hierarchical categorization learning is associated with representational changes in the dorsal striatum and posterior frontal and parietal cortex. *Human Brain Mapping*.

Harris, C. W., Finn, K. R., Kieseler, M.-L., **Maechler**, **M. R.**, & Tse, P. U. (2023). Deepaction: A matlab toolbox for automated classification of animal behavior in video. *Scientific Reports*.

Cavanagh, P., Anstis, S., Lisi, M., Wexler, M., **Maechler**, **M. R.**, 't Hart, M. B., Shams-Ahmar, M., & Saleki, S. (2022). Exploring the frame effect. *Journal of Vision*, *22*(12), 5–5.

Desrochers, T. M., Ahuja, A., **Maechler**, **M. R.**, Shires, J., Yusif Rodriguez, N., & Berryhill, M. E. (2022). Caught in the acts: Defining abstract cognitive task sequences as an independent process. *Journal of Cognitive Neuroscience*, *34*(7), 1103–1113.

Maechler, **M. R.**, Cavanagh, P., & Tse, P. U. (2021). Attentional tracking takes place over perceived rather than veridical positions. *Attention, Perception, & Psychophysics*, *83*(4), 1455–1462.

Maechler, **M. R.**, Heller, N. H., Lisi, M., Cavanagh, P., & Peter, U. T. (2021). Smooth pursuit operates over perceived not physical positions of the double-drift stimulus. *Journal of Vision*, *21*(11), 6–6.

Erlikhman, G., Lytchenko, T., Heller, N. H., **Maechler**, **M. R.**, & Caplovitz, G. P. (2020). Object-based attention generalizes to multisurface objects. *Attention, Perception, & Psychophysics*, *82*(4), 1599–1612.