



PhD position on spatial coding in old age

The [German Center for Neurodegenerative Diseases \(DZNE\)](#) is a unique non-university research center dedicated to the subject of dementia and all its facets, as well as other neurodegenerative diseases. The DZNE stands for excellence in research and science management, translation of scientific results into practice, interdisciplinarity and internationalization. With over 1000 employees from 55 nations, spread over 10 sites in Germany, the DZNE is one of the leading research centers in the field.

One 4-year PhD position is available in the [Aging, Cognition & Technology group](#), headed by Prof. Thomas Wolbers. In this project, we will characterise how human aging affects computations in key parts of the human navigation network, in particular **brain structures hosting grid and head direction cells**. In addition, a novel cohort of so-called Superagers allows for conducting unique studies with older people with exceptional memory abilities. Using a combination of cutting-edge interactive **virtual reality (VR)** systems and **ultra-high field neuroimaging**, you will develop innovative VR paradigms and use computational models to generate novel predictions of spatial coding. Importantly, the successful candidate will be encouraged to develop their own research interests, and, if desired, they can be involved in teaching activities.

In addition to hosting research dedicated 3T and 7T MRI scanners, the Magdeburg site of the DZNE, where the group is based, provides access to EEG, MEG, TMS and eye tracking systems. Furthermore, we have a range of cutting-edge VR setups, and we entertain multiple collaborations in Europe and North America. Finally, Magdeburg University has recently established a unique research center on [Neural Resources of Cognition](#), which provides ample opportunities for interdisciplinary collaborations.

For this position, excellent statistical skills and a strong interest in cognitive aging and computational modelling are a plus. Furthermore, you will have, or be in the final stages of, a BSc/MSc in psychology, cognitive neuroscience, neuroimaging methods or applied statistics. Ideally, you should already possess computer programming skills (e.g. in Python, R, Matlab). You will be thorough, efficient, a good communicator, and enjoy working as part of an international and dynamic team.

For further information about this position, please email Thomas Wolbers (thomas.wolbers@dzne.de). To learn more about our research, please visit our [website](#) and follow us on Twitter ([@WolbersLab](#)).

To submit your application, please visit

Further reading:

Segen V, Ying J, Morgan E, Brandon M, Wolbers T (2022) Path integration in normal aging and Alzheimer's disease. **Trends in Cognitive Sciences** 26:142–158.

Diersch, N., Valdes-Herrera, J.P., Tempelmann, C., Wolbers T. (2021). Increased hippocampal excitability and altered learning dynamics mediate cognitive mapping deficits in human aging. **Journal of Neuroscience**, 41(14):3204-3221.

Stangl, M., Achtzehn, J., Huber, K., Dietrich, C., Tempelmann, C., & Wolbers, T. (2018). Compromised grid-cell-like representations in old age as a key mechanism to explain age-related navigational deficits. **Current Biology**, 28(7), 1108-1115.