

Khazar Ahmadi

✉ khazar.ahmadi@rub.de | [@khAzArAhmAdi](https://twitter.com/khAzArAhmAdi) | [Google Scholar](https://scholar.google.com/citations?user=...) | [Orcid](https://orcid.org/...)

Research Overview

My research is primarily focused on elucidating the underlying mechanisms of episodic memory and spatial navigation in health, aging and disease. To this end, I use a variety of techniques including state-of-the-art neuroimaging, neuropsychological assessments, and computational models to explore the functional and structural architecture of the human brain in particular the medial temporal lobe regions at fine levels of detail.

Academic Experience

Ruhr University Bochum

Postdoctoral Researcher with Prof. Nikolai Axmacher

Bochum, Germany

2022 - Present

Lund University

Postdoctoral Researcher with Prof. Oskar Hansson

Lund, Sweden

2020 - 2022

Spinoza Center for Neuroimaging

Visiting Researcher at the group of Prof. Serge Dumoulin

Amsterdam, Netherlands

2017

University Medical Center Groningen

Visiting Researcher at the group of Prof. Frans Cornelissen

Groningen, Netherlands

2017

Education

Otto-von-Guericke University

PhD in psychology (magna cum laude)

Magdeburg, Germany

2014 - 2019

- Thesis title: Plasticity and stability of the cortical wiring in the human visual system
- Advisor: Prof. Michael Hoffmann

Shahid Beheshti University

M.Sc. in child and adolescent clinical psychology (with distinction)

Tehran, Iran

2010 - 2013

Tabriz University

B.Sc. in clinical psychology (with distinction)

Tabriz, Iran

2006 - 2010

Publications

Published Manuscripts

- **Ahmadi, K.**, Pereira, J., van Westen, D., Pasternak, O., Zhang, F., Nilsson, Stomrud, E., Spotorno, N. and Hansson, O. (2024). Fixel-based analysis reveals tau-related white matter changes in early stages of Alzheimer's disease. *Journal of Neuroscience*. [\[Link\]](#)
- Molz, B., Herbig, A., Baseler, H., de Best, P., RAZ, N., Gouws, A., **Ahmadi, K.**, Lowndes, R., McLean, R., Gottlob, I., Kohl, S., Choritz, L., Maguire, J., Kanowski, M., Käsmann-Kellner, B., Wieland, I., Banin, E., Levin, N., Morland, A., and Hoffmann, M.B. (2023). Achromatopsia - limits to visual cortex plasticity in the absence of functional cones. *Investigative Ophthalmology & Visual Science* [\[Link\]](#)
- Cicognola, C., Mattsson-Carlsson, N., van Westen, D., Zetterberg, H., Blennow, K., Palmqvist, S., **Ahmadi, K.**, Strandberg, O., Stomrud, E., Janelidze, S., Hansson, O. (2023). Associations of CSF PDGFRβ with aging, blood-brain barrier damage, neuroinflammation and Alzheimer disease pathological changes. *Neurology*. [\[Link\]](#)
- **Ahmadi, K.**, Pereira, J. B., Berron, D., Vogel, J., Ingala, S., Strandberg, O. T., Janelidze, S., Barkhof, F., Pfeuffer, J., Knutsson, L., van Westen, D., Palmqvist, S., Mutsaerts, H. J., Hansson, O. (2022). Gray matter hypoperfusion is a late pathological event in the course of Alzheimer's disease. *Journal of Cerebral Blood Flow & Metabolism*. [\[Link\]](#)

- Molz, B., Herbig, A., Baseler, H. A., de Best, P., Vernon, R., Raz, N., Gouws, A. D., **Ahmadi, K.**, Lowndes, R., Mclean, R. J., Gottlob, I., Kohl, S., Choritz, L., Maguire, J., Kanowski, M., Käsmann-Kellner, B., Wieland, I., Banin, E., Levin, N., Hoffmann, M. B., Morland, A. B. (2021). Structural changes to primary visual cortex in the congenital absence of cone input in achromatopsia. *NeuroImage: Clinical*. [\[Link\]](#)
- Puzniak, R. J., McPherson, B.*, **Ahmadi, K.***, Herbig, A., Kaufmann, J., Liebe, T., Gouws, A. D., Morland, A. B., Gottlob, I., Hoffmann, M. B., Pestilli, F. (2021). CHIASM, the human brain albinism and achiasma MRI dataset. Scientific data. [* shared second-authorship; [Link](#)]
- Lowndes, R., Molz, B., Warriner, L., Herbig, A., de Best, P., Raz, N., Gouws, A. D., **Ahmadi, K.**, Mclean, R. J., Gottlob, I., Kohl, S., Choritz, L., Maguire, J., Kanowski, M., Käsmann-Kellner, B., Wieland, I., Banin, E., Levin, N., Hoffmann, M. B., Morland, A. B., Baseler, H. (2021). Structural differences across multiple visual cortical regions in the absence of cone function in congenital achromatopsia. *Frontiers in Neuroscience*. [\[Link\]](#)
- **Ahmadi, K.**, Fracasso, A., Puzniak, R. J., Gouws, A. D., Yakupov, R., Speck, O., Kaufmann, J., Pestilli, F., Dumoulin, S. O., Morland, A. B., Hoffmann, M. B. (2020). Triple visual hemifield maps in optic chiasm hypoplasia. *NeuroImage*. [\[Link\]](#)
- Carvalho, J., Invernizzi, A., **Ahmadi, K.**, Hoffmann, M. B., Renken, R. J., Cornelissen, F. W. (2020). Micro-probing enables fine-grained mapping of neuronal populations using fMRI. *NeuroImage*. [\[Link\]](#)
- Puzniak, R. J., **Ahmadi, K.**, Kaufmann, J., Gouws, A. D., Morland, A. B., Pestilli, F., Hoffmann, M. B. (2019). Quantifying nerve decussation abnormalities in the optic chiasm. *NeuroImage: Clinical*. [\[Link\]](#)
- **Ahmadi, K.**, Herbig, A., Wagner, M., Kanowski, M., Thieme, H., Hoffmann, M. B. (2019). Population receptive field and connectivity properties of the early visual cortex in human albinism. *NeuroImage*. [\[Link\]](#)
- Eick, C., **Ahmadi, K.**, Sweeney-Reed, C. M., Hoffmann, M. B. (2019). Interocular transfer of visual memory: influence of visual impairment and abnormalities of the optic chiasm. *Neuropsychologia*. [\[Link\]](#)
- **Ahmadi, K.**, Fracasso, A., van Dijk, J. A., Kruijt, C., van Genderen, M., Dumoulin, S. O., & Hoffmann, M. B. (2018). Altered organization of the visual cortex in FHONDA syndrome. *NeuroImage*. [\[Link\]](#)
- Arngim⁺, N., Hougaard⁺, A., **Ahmadi, K.***, Vestergaard*, M. B., Schytz, H. W., Amin, F. M., Larsson, H.B.W., Olesen, J., Hoffmann, M.B. & Ashina, M. (2017). Heterogenous migraine aura symptoms correlate with visual cortex functional magnetic resonance imaging responses. *Annals of neurology*. [⁺ & * shared first & second-authorship; [Link](#)]
- Hoffmann, M. B., Thieme, H., & **Ahmadi, K.** (2017). Potential of fMRI for the Functional Assessment of the Pathological Visual System. *Klinische Monatsblätter für Augenheilkunde*. [\[Link\]](#)
- **Ahmadi, K.**, Pouretmad, H. R., Esfandiari, J., Yoonessi, A., Yoonessi, A. (2015). Psychophysical evidence for impaired Magno, Parvo, and Konio-cellular pathways in dyslexic children. *Journal of ophthalmic & vision research*. [\[Link\]](#)

Conference Presentations

Talks

- **Ahmadi, K.** (2024). Laminar profile of hippocampal subregions during spatial navigation. International Society for Magnetic Resonance in Medicine (ISMRM), Singapore, Singapore.
- **Ahmadi, K.** (2022). Tau accumulation is associated with fiber-specific white matter degeneration in Alzheimer's disease. International Society for Magnetic Resonance in Medicine (ISMRM), London, England.
- **Ahmadi, K.** (2022). Disentangling fiber-specific white matter alterations in relation to hallmarks of Alzheimer's disease. Alzheimer's Disease and Parkinson's Disease (ADPD), Barcelona, Spain.
- **Ahmadi, K.** (2021). Altered cerebral blood perfusion in Alzheimer's disease spectrum and its association with amyloid- β and tau pathology. Alzheimer's Disease and Parkinson's Disease (ADPD), Virtual conference.

- **Ahmadi, K.** (2018). Macroscopic and mesoscopic cortical organization in congenital visual pathway abnormalities. Brain-in-depth (BID) - Symposium on layer-dependent MRI, German Center for Neurodegenerative Diseases (DZNE), Magdeburg, Germany.
- **Ahmadi, K.** (2018). Altered organization of the visual cortex in FHONDA syndrome. 4th European Days of Albinism, Hurdal Vision and Activity Center, Oslo, Norway.
- **Ahmadi, K.**, (2016). Altered retino-cortical connections and visual cortex reorganization in the recently discovered FHONDA syndrome. Society for neuroscience (SfN), San Diego, USA.

Poster Presentations

- **Ahmadi, K.**, Stawarczyk, D., Pfaffenrot, V., Gomes, C. A., Kashyap, S., Patai, Z., Norris, D. G., Axmacher, N. (2024). Laminar profiles of hippocampal subfields are differentially associated with navigation strategies. Organization for Human Brain Mapping (OHBM), Seoul, south Korea.
- **Ahmadi, K.**, Pereira, J. B., Berron, D., Vogel, J., Ingala, S., Strandberg, O. T., Janelidze, S., Barkhof, F., Pfeuffer, J., Knutsson, L., van Westen, D., Mutsaerts, H. J., Palmqvist, S., Hansson, O. (2021). Tau and synaptic biomarkers but not amyloid- β are associated with cerebral perfusion in the Alzheimer's disease spectrum. Alzheimer's Association International Conference (AAIC), Virtual conference.
- Cicognola, C., Janelidze, S., Van Westen, D., **Ahmadi, K.**, Hansson, O. (2021). Cerebrospinal fluid platelet-derived growth factor receptor beta measured in BioFinder-2: an early biomarker in the Alzheimer's disease continuum? Clinical Trials on Alzheimer's Disease (CTAD), Boston, USA.
- Puzniak, R. J., McPherson, B., **Ahmadi, K.**, Herbig, A., Kaufmann, J., Liebe, T., Gouws, A. D., Morland, A. B., Gottlob, I., Hoffmann, M. B., Pestilli, F. (2020). Chiasmal malformations dataset: a unique neuroimaging testbed. Vision Science Society (VSS), Virtual conference.
- Hoffmann, M. B., Molz, B., Herbig, A., de Best, P., Raz, N., Gouws, A. D., **Ahmadi, K.**, Lowndes, R., Mclean, R. J., Kohl, S., Gottlob, I., Choritz, L., Maguire, J., Kanowski, M., Käsmann-Kellner, B., Wieland, I., Banin, E., Levin, N., Baseler, H. Morland, A. B. (2020). Visual cortex stability and plasticity in the absence of functional cones in achromatopsia. Vision Science Society (VSS), Virtual conference.
- **Ahmadi, K.**, Fracasso, A., Puzniak, R. J., Gouws, A. D., Yakupov, R., Speck, O., Kaufmann, J., Pestilli, F., Dumoulin, S. O., Morland, A. B., Hoffmann, M. B. (2019). Triple hemi-field input to the visual cortex in a patient with chiasmal hypoplasia. Organization for Human Brain Mapping (OHBM), Rome, Italy.
- Carvalho, J., **Ahmadi, K.**, Invernizzi, A., Hoffmann, M. B., Renken, R., Cornelissen, F. W. (2019). Micro-probing the visual cortex: high-resolution mapping of neuronal sub-populations. Organization for Human Brain Mapping (OHBM), Rome, Italy.
- Puzniak, R. J., **Ahmadi, K.**, Kaufmann, J., Gouws, A. D., Morland, A. B., Pestilli, F., Hoffmann, M. B. (2019). Quantification of nerve decussation abnormalities in the optic chiasm. Organization for Human Brain Mapping (OHBM), Rome, Italy.
- Prabhakaran, G., Al-Nosairy, K. O., Tempelmann, C., **Ahmadi, K.**, Hoffmann, M. B. (2019). Brain activity in input-deprived visual cortex in glaucoma – no fMRI-evidence of plasticity. Organization for Human Brain Mapping (OHBM), Rome, Italy.
- **Ahmadi, K.**, Fracasso, A., Gouws, A. D., Morland, A. B., Dumoulin, S. O., Hoffmann, M. B. (2017). Functional organization of the visual cortex in a unique case of achiasma. Society for neuroscience (SfN), Washington, D.C., USA.
- **Ahmadi, K.**, Fracasso, A., van Dijk, J. A., Kruijt, C., van Genderen, M., Dumoulin, S. O., & Hoffmann, M. B. (2017). Cortical plasticity in FHONDA: a new inherited visual system disorder. European conference on visual perception (ECVP), Berlin, Germany.
- **Ahmadi, K.**, Pouretmad, H. R., Esfandiari, J., Yoonessi, A. (2013). Investigation of magno, parvo and koniocellular pathways in children with dyslexia. International conference of cognitive sciences (ICCS), Tehran, Iran.

Technical Skills

Neuroimaging Modalities	fMRI (at 7 and 3 T), dMRI, sMRI & ASL
Neuroimaging Software	Nipype, AFNI, FSL, MRtrix, DIPY, FreeSurfer, Laynii, ExploreASL, Hippunfolds, ASHS, SPM, ANTs & MrVista
Neuroimaging Hardware	Siemens 7T MAGNETOM Terra Scanner Operator
Programming	Bash, R, Python, MATLAB, \LaTeX
Experiment Software	Psychtoolbox, Neurobehavioral Systems Presentation
Languages	Azerbaijani (native), Persian (native), English (fluent), German (upper-intermediate fluency; Level B2)

Awards and Honors

Erwin L. Hahn Institute's brain-art competition (About)	2023 Essen, Germany
<ul style="list-style-type: none">Winning art-work "Hippocampal Moon" € 200	
Greta & Johan Kock's foundation grant for medical research (About)	2021 Lund, Sweden
<ul style="list-style-type: none">Role: Principal InvestigatorProject: Clinical use of novel diffusion-MRI markers in Alzheimer's disease€ 10K research funds	
Lund University MultiPark travel grant (About)	2021-2022 Lund, Sweden
<ul style="list-style-type: none">€ 2K in total covering conference registrations and travel costs	
The ISMRM Summa Cum Laude Merit Award (About)	2022 London, UK
<ul style="list-style-type: none">Selected abstract in top 5% of all submissions	
Marie Curie Ph.D Fellowship Research Training in Computational Visual Neuroscience	2015-2018 Magdeburg, Germany
Top Student Award Undergraduate Class Ranked: 1 st /50	2010 Tabriz, Iran

Teaching & Mentorship

Ruhr University Bochum Main Instructor of "Aging, dementia and memory disorders" Main Instructor of "fMRI: From Theory to Practice"	Bochum, Germany 2024 2022 - 2023
<ul style="list-style-type: none">Mentored Students: Dana Schröder & Paul Höchter (research assistants), Kubra Karatas, Niko Britt (M.Sc & B.Sc interns), Alena Machentanz (B.Sc Thesis)	
Neuromatch Academy: Computational Neuroscience Workshop Mentor of the group "NeuroMatched Philosophers"	Online Event 2021
<ul style="list-style-type: none">Project: predicting fearful stimuli from HCP fMRI data using MVPA	
Otto-von-Guericke University Instructor of "Neuroscience Journal Club"	Magdeburg, Germany 2016 - 2018
<ul style="list-style-type: none">Co-mentored Students: Charlotta Eick (M.Sc Thesis), Gokulraj Prabhakaran (junior PhD) Anne Herbig (Postdoc with no imaging background)	

Professional Service

Ad-hoc Reviewer

Alzheimer's & Dementia, Alzheimer's Research & Therapy, Journal of Cerebral Blood Flow & Metabolism, Brain Communications, Scientific Reports, Neuropsychologia, British Journal of Ophthalmology, ISMRM abstracts (x 33), OHBM abstracts (x 31)

Symposia & Lecture Organization

“Advances in Layer-specific fMRI”

“Surface-based analysis for Hippocampal subfield segmentation”

Bochum, Germany

2023

Public Outreach

Long Night of Science at Otto-von-Guericke University

Magdeburg, Germany

2016 - 2019

Memberships

Trainee Member of ISMRM, SfN, OHBM, ECVP, ADPD & AAIC