

Amin Ghaderi Kangavari

[Google Scholar](#), [GitHub](#)

Email

- amin.g.ghaderi@gmail.com & amingk@drcmr.dk

ACADEMIC POSTIONS

- 2023 - Present: Postdoctoral researcher, Danish Research Centre for Magnetic Resonance, Copenhagen University Hospital Hvidovre, Denmark

EDUCATION

- Ph.D. in Cognitive modeling, Institute for Cognitive and Brain, Shahid Beheshti University, Tehran, Iran, February 2023.
Dissertation Topic: Linking behavioral modeling to components of brain imaging in perceptual decision making.
Group supervisors: Jamal Amani Rad, Michael D. Nunez, Kourosch Parand and Reza Ebrahimpour
- M.S. in Computer Science, Shahid Beheshti University, Tehran, Iran, July 2016.
Dissertation Topic: Applications of numerical approximation functions in engineering
Supervisor: Kourosch Parand.
- B.S. in Computer Science, Damghan University, Iran, July 2014.

Publications

- **Amin Ghaderi-Kangavari**, Jamal Amani Rad, Kourosch Parand, & Michael D. Nunez (2022). Neuro-cognitive models of single-trial EEG measures describe latent effects of spatial attention during perceptual decision making, [Journal of Mathematical Psychology](#).
<https://www.sciencedirect.com/science/article/abs/pii/S0022249622000633>
- **Amin Ghaderi-Kangavari**, Jamal Amani Rad, & Michael D. Nunez (2022), A general integrative neurocognitive modeling framework to jointly describe EEG and decision-making on single trials, [Computational Brain and Behavior](#).
<https://link.springer.com/article/10.1007/s42113-023-00167-4>
- **Amin Ghaderi-Kangavari**, Kourosch Parand, Reza Ebrahimpour, Michael D. Nunez, & Jamal Amani Rad (2021), How spatial attention affects the decision process: looking through the lens of Bayesian hierarchical diffusion model & EEG analysis, [Journal of Cognitive Psychology](#).
<https://www.tandfonline.com/doi/abs/10.1080/20445911.2023.2187714>
- Kourosch Parand, **Amin Ghaderi**, Mehdi Delkhosh, & Hossein Yousefi (2016). A new approach for solving nonlinear Thomas-Fermi equation based on fractional order of rational Bessel functions. [Electronic Journal of Differential Equations](#), 2016(331), 1-18.
<https://ejde.math.txstate.edu/Volumes/2016/331/parand.pdf>
- Kourosch Parand, Hossein Yousefi, Mehdi Delkhosh, & **Amin Ghaderi** (2016). A novel numerical technique to obtain an accurate solution to the Thomas-Fermi equation. [The European Physical Journal Plus](#), 131(7), 1-16.
<https://link.springer.com/article/10.1140/epjp/i2016-16228-x>
- Kourosch Parand, Pooria Mazaheri, Mehdi Delkhosh, & **Amin Ghaderi** (2017). New numerical solutions for solving Kidder equation by using the rational Jacobi

functions. *SeMA Journal*, 74(4), 569-583.
<https://link.springer.com/article/10.1007/s40324-016-0103-z>

- Kourosh Parand, **Amin Ghaderi-Kangavari**, & Mehdi Delkhosh. Two Efficient Computational Algorithms to Solve the Nonlinear Singular Lane-Emden Equations, *Astrophysics*, vol. 63(2020), No. 1 ,PP. 133–150.
<https://link.springer.com/article/10.1007/s10511-020-09621-8>

CONFERENCE

- **Amin Ghaderi-Kangavari**, Jamal Amani Rad, & Michael D. Nunez (2022), Novel neuro-cognitive models can explore spatial attention's effect on perceptual decision making, Society for Mathematical Psychology.
<https://mathpsych.org/presentation/757>
- **Amin Ghaderi-Kangavari**, Jamal Amani Rad, Kourosh Parand, Reza Ebrahim-pour (2021), Contralateral oscillations related to modulation of top-down attention in perceptual decision making: a Bayesian hierarchical diffusion model and EEG analysis, Society for Mathematical Psychology.
<https://mathpsych.org/presentation/497>
- **Amin Ghaderi**, Jamal Amani Rad, Hamidreza Pouretamad (2017), A Neuro-Heuristic technique to calculate one-dimensional FitzHugh-Nagumo Neuron Model, 6th Basic and Clinical Neuroscience Congress
- Kourosh Parand, & **Amin Ghaderi** (2017). An Artificial Neural Network algorithm to solve third-order Emden-Fowler type problems. In *The Second National Conference on Meta-Heuristic Algorithms and Their Applications in Engineering and Science*.

Professional skills

EEG: (ERPs, SVD, Single-trial analysis, ICA artifact correction, MNE-package in python, EEGLAB, etc.)

fMRI: (Graph-theory, GLM, FSL, nilearn in Python)

Model-based Cognitive Neuroscience: (Simulation-based approach , Hierarchical Bayesian model, Single-trial joint modeling)

Mathematical Psychology: (Drift-diffusion model, Sequential sampling model (LBA, Race, and etc.), RL-DDM, Circular diffusion model, Signal detection theory)

Statistics: (Bayesian inference, MCMC, Likelihood-free inference, Simulation-based method, Deep learning for parameter estimation)

Mathematics: (Tensor decomposition, Linear Algebra, Partial differential equation, Ordinary differential equation)

Computer science: (Machine learning, Deep learning, Parallel computing, CNN, Artificial Neural Networks, Keras, TensorFlow)

Programming: (Python, Stan (PyStan), R, Matlab, C#, Maple and LATEX)

Common softwares: (BaysFlow, fastDM, hBayesDM, HDDM and rlssm)

Open science

- 'NDDM' is a repository to integrate simultaneously both single-trial EEG measures and behavioral performance (response time and accuracy) to understand cognition.
<https://github.com/AGhaderi/NDDM>
- 'spatial_attenNCM' repository used some neuro-cognitive models to find out the spatial attention effect on perceptual decision making. It can separate visual encoding time (VEN) and motor execution time (MET) by N200 latencies which determine the onset of the evidence accumulation. Extraction of N200 latencies was based on singular value decomposition (SVD) to strengthen the single final

waveform from whole electrodes.

https://github.com/AGhaderi/spatial_attenNCM

- 'MNE-preprocessing' repository is a python repository to pre-process electroencephalographic (EEG) raw data based on basic and unanimous approaches.
<https://github.com/AGhaderi/MNE-Preprocessing>
- 'hDDM_attention' repository is able to assess the relationship between EEG components and HDDM parameters of top-down attention in perceptual decision-making using a multiple regression model.
https://github.com/AGhaderi/hDDM_attention

Language

- Persian and English.