Hao Zhu

PhD student

Neurorobotics Lab
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Education

2024– **PhD in Computer Science**, *University of Freiburg*, Freiburg i. Br., Germany
Advisors: Prof. Joschka Boedecker, Prof. Ilka Diester

2021–2023 **M.Sc. in Neuroscience**, *University of Freiburg*, Freiburg i. Br., Germany
GPA - 3.8 | German grade - 1.3
Thesis: *Deciphering Decision Making with Inverse Reinforcement Learning*
Advisors: Prof. Ilka Diester, Prof. Joschka Boedecker

2016–2020 **B.Sc. Chemical Biology**, *Nankai University*, Tianjin, China
GPA - 3.6 | average grade 89.4/100
Thesis: *Identification of Functional Residues in the Human Protoporphyrinogen Oxidase with the Network Model and Site-Directed Mutagenesis*
Advisors: Prof. Xin Wen, Prof. Zhen Xi

Academic Experience

2024– **Scientific Researcher**, *Neurorobotics Lab, University of Freiburg*, Freiburg i. Br., Germany
Part of the collaborative research project *IN-CODE* on 1) fundamental research of deep learning and (inverse) reinforcement learning, and 2) application of machine learning in neuroscience.

2022–2023 **Research Intern**, *Optophysiology Lab, University of Freiburg*, Freiburg i. Br., Germany
Led a research project on the mathematical modeling of rodent complex foraging behavior via (inverse) reinforcement learning.

2022 **Research Intern**, *Straw Lab, University of Freiburg*, Freiburg i. Br., Germany
Led a research project on 1) developing Kalman filter auto-tuning algorithm for animal tracking, and 2) designing event-camera-based lock-on tracker prototype, steering multiple cameras for tracking bees in the wild.

2017–2021 **Undergraduate Researcher/Research Assistant**, *State Key Laboratory of Elemento-organic Chemistry, Nankai University*, Tianjin, China
Led the National Training Program of Innovation and Entrepreneurship for Undergraduates project titled *Computational Simulation and Biological Verification for Different Species of Protoporphyrinogen IX Oxidase Amino Acid Interactions*, aiming at identifying key amino acid residues in protoporphyrinogen oxidase with computational quantum mechanics, molecular dynamics simulation, and graph theory.

Awards

2020 **Innovative Scientific Research Award for College Students**, *Nankai University*, China
Excellence Award

2018 **Asymchem Scholarship of Chemistry College**, *Nankai University*, China

2017 **Asymchem Scholarship of Chemistry College**, *Nankai University*, China

Membership

2024– IEEE

2024– IEEE Computational Intelligence Society

2024– German Neuroscience Society (GNS)

2024– Federation of European Neuroscience Societies (FENS)

Publications

Hao Zhu, Brice De La Crompe, Gabriel Kalweit, Artur Schneider, Maria Kalweit, Ilka Diester, and Joschka Boedecker. L (M) V-IQL: Multiple intention inverse reinforcement learning for animal behavior characterization. *arXiv preprint arXiv:2311.13870*, 2023.

Baifan Wang, Zijuan Zhang, Hao Zhu, Congwei Niu, Xin Wen, and Zhen Xi. The hydrogen bonding network involved Arg59 in human protoporphyrinogen IX oxidase is essential for enzyme activity. *Biochemical and Biophysical Research Communications*, 557:20–25, 2021.

References

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