

FERNANDO A. ORTEGA

(612) 735-2072 | aguil194@umn.edu | Jackson Hall 321 Church Street SE

Minneapolis, MN 55455

<https://thenandolab.github.io/>

<https://www.linkedin.com/in/fernando-aguilar-ortega/>

OBJECTIVE

Experienced neuroscientist specializing in cognitive processes and diffusion-weighted Magnetic Resonance Imaging (dMRI). Passionate about investigating neuropsychiatric disorders through mapping the brain's complex networks. Seeking to enhance my expertise through the Neuroscience Ph.D. program at [Name of the Ph.D. Program], with the ultimate goal of founding and directing my own research lab.

EDUCATION

Minnesota Inclusive Neuroscience Development Scholars (MINDS) Program Minneapolis, MN

Two year post-baccalaureate program in neuroscience

July 2022 - Present

- Conducting substantial laboratory research that encourages both intellectual and technical growth, facilitating confidence in lab settings.
- Gaining hands-on experience in delivering research outcomes through poster presentations, oral presentations, and publications.
- Receiving individualized mentorship and professional skill development with the goal of becoming a future leader in neuroscience.
- Aiming to increase access to meaningful research experiences and develop skills necessary for a successful career in neuroscience.

University of Washington eScience Institute

Seattle, Washington

Neurohackademy - Intensive dMRI summer course

August 7-18, 2023

- Developed expertise in using various technologies for the analysis of human neuroscience data, with a focus on the shareability and reproducibility of results.
- Immersed myself in a robust learning experience through active participation in hands-on lectures, in-depth Q&A discussions.

DIPY Online Workshop 2023

Virtual

Diffusion Imaging in Python program

April 24-28, 2023

- Engaged in a comprehensive online workshop, designed to sharpen skills and deepen knowledge in the realm of structural and diffusion imaging.
- Reinforced theoretical foundations and practical applications of diffusion imaging, enhancing expertise in key areas such as diffusion theory, data pre-processing, and fiber tracking.
- Enriched professional network through meaningful interactions with like-minded peers, fostering collaborative relationships in the field.

St. Olaf College

Northfield, MN

Bachelor of Arts in Biology and Psychology Neuroscience Concentration

Fall 2018 - Spring 2022

- Successfully completed an interdisciplinary course load, deepening understanding of biological and psychological principles and their intersection within neuroscience.
- Undertook intensive laboratory coursework, developing practical skills in scientific experimentation and data analysis.
- Enhanced understanding of neuropsychiatric disorders through a concentration in neuroscience, setting the groundwork for future research ambitions.

RESEARCH

University of Minnesota Department of Neuroscience

Minneapolis, MN

Researcher at Heilbronner Lab

June 2022 - Present

- Skillfully employ cutting-edge MR diffusion tractography techniques to elucidate the complex connectivity patterns of the posteromedial cortex (PMC).
- Investigate the intricate cortico-striatal connectivity of the PMC in macaques, providing cross-species insights into this essential brain region.
- Delve into the burgeoning role of the PMC as a critical hub within the default mode network

(DMN), contributing to the advancement of functional connectivity research.

- Contributed to bridging the knowledge gap between in vivo imaging and ex vivo tract-tracing methodologies, thereby enhancing our understanding of the human brain's mesoscale anatomical structure.

St. Olaf College Department of Biology and Neuroscience Program

Northfield, MN

Undergraduate Researcher at Lee Lab

May 2021 - May 2022

- Investigated the behavioral changes in *Ormia ochracea* when introduced to alcohol in their food source, providing insights into the impact of substances on auditory and navigational behaviors.
- Utilized DeepLabCut technology for precise animal pose estimation, providing accurate tracking and analysis of fly and cricket behaviors.
- Employed diverse research methodologies, including psychophysical experiments, field playback experiments, neural recordings, and biophysical measurements of the fly and cricket auditory periphery.

St. Olaf College Department of Psychology

Northfield, MN

Undergraduate Researcher at Petok Lab

Sept 2021 - Dec 2021

- Conducted an in-depth examination of the influence of fMRI and structural MRI presentations on the perceived validity of scientific articles, enhancing understanding of how neuroimaging data presentation affects public perception.
- Engaged in all aspects of a comprehensive semester-long research project, from initial literature review, study design and crafting of the IRB proposal, through to hands-on data collection and sophisticated data analysis using SPSS.
- Recruited and facilitated data collection from 31 participants, ensuring the robustness and reliability of the research findings.

University of Minnesota Department of Plant Pathology

Northfield, MN

Summer Undergraduate Student Researcher at Dill-Macky Lab

June 2019 - September 2019

- Conducted research on plant pathogens, honing laboratory techniques such as DNA extraction and loop-mediated isothermal amplification (LAMP) assays, foundational experiences that can be applied to neuroscientific studies.
- Acquired expertise in the use of sophisticated analytical methodologies, specifically Duveiller's (Duveiller, 1992) method, for the assessment and quantification of disease severity, equipping me with analytical skills readily applicable to the interpretation and evaluation of neuroimaging data.
- Synthesized and applied research findings to formulate effective disease management strategies, aiding in the reduction of pathogen impact on cereal crop yield and quality. Furthermore, these findings were disseminated and published for practical use by farmers, exemplifying the real-world implications and utility of rigorous scientific research.

PUBLICATIONS and PRESENTATIONS

- **Ortega, F. A.**, Aarrestad, I., Dickinson, S., Lee, N. "Quantifying Behavioral Preference for Ethanol of The Parasitoid Fly *Ormia ochracea* (Diptera: Tachinidae)." Forthcoming 2024
- **Monko, M.E., Hart, D., Ortega, F.A., Heilbronner, S.R.** "The Posteromedial Cortex across Species." Forthcoming 2024-5
- Wikle, A., Lee, N., Gallagher, J., Broder, D., Abdulkarim, I., Carlson, M., **Ortega, F. A.**, Tinghitella, R. "Behavioral and Neurophysiological Responses of a Parasitoid to Novel Host Signals." Forthcoming 2023
- Draxler, B., Melby, A., Thao, J., Hart, K., and **Ortega, F. A.** "Emerging Writers, Emerging Activists: A Public Humanities Approach to the First Year Seminar" in *Literacy Practices in Public Spaces: Opportunities and Challenges of Community-Engaged Research in Literacy Education*. Forthcoming 2023.

PRESENTATIONS

University of Minnesota Department of Neuroscience
Researcher at Heilbronner Lab

Minneapolis, MN

TEACHING EXPERIENCE

St. Olaf College Biology Department

Northfield, MN

Intermediate Genetics Lab Teaching Assistant (TA)

February 2021 - May 2021

- Assisted the instructor in implementing the lab curriculum, ensuring a coherent and effective learning experience.
- Actively guided students by clarifying instructions, answering questions, and providing constructive feedback on their work, enhancing their comprehension and engagement.
- Performed various laboratory techniques, including Polymerase Chain Reactions (PCR) and specialized forms such as Reverse-Transcriptase PCR, contributing to both educational demonstrations and research processes.

SKILLS

- Proficient in working with FSLeyes, a powerful neuroimaging data visualization tool, for the effective display and analysis of brain imaging data.
- Highly skilled in diffusion magnetic resonance imaging (dMRI) and tractography techniques, facilitating the in-depth investigation of neural connectivity and structural organization within the brain.
- Demonstrated ability to integrate advanced neuroimaging tools and techniques, such as FSLeyes, dMRI, and tractography, to drive innovative research and enhance understanding of complex neural systems.
- Proficient in a wide range of assays for studying the nervous system at molecular, cellular, and circuit levels, including multiphoton microscopy, AAV-mediated neuronal transfection, halorhodopsin, immunostaining, immunofluorescence, CRISPR, and in situ hybridization.
- Strong statistical computing and data visualization skills, with experience in RStudio, SPSS, and IMOD for comprehensive data analysis and interpretation.
- Expertise in utilizing DeepLabCut, a state-of-the-art open-source method for 3D markerless pose estimation of animal behavior, achieving exceptional accuracy with minimal frames (50-200).
- Solid understanding of experimental design and data analysis principles, allowing for the effective planning, execution, and interpretation of complex research projects.
- Demonstrated ability to adapt and learn new techniques quickly, ensuring the successful application of cutting-edge methodologies in diverse research contexts.
- Strong communication and collaboration skills, facilitating productive teamwork and the sharing of ideas and expertise within interdisciplinary research environments.

AWARDS AND HONORS

- **Poster Award**, University of Minnesota Department of Neuroscience Postbaccalaureate Symposium, 2023.
- **Professional Development Fund Award**, University of Minnesota, 2023
Successfully secured a \$3000 grant for professional development. Funds were utilized to attend the DIPY Workshop 2023 and OHBM 2023, enriching my knowledge and technical capabilities in dMRI.
- **DIPY Workshop 2023 Completion Certificate**
Successfully completed a comprehensive program held from April 24th to April 28th, 2023. The workshop focused on key concepts and advancements in the field of diffusion MRI and medical imaging methods, further bolstering my technical skills and knowledge base in these areas.

PROFESSIONAL AFFILIATIONS

Nu Rho Psi, National Honor Society in Neuroscience

- Invited to join this prestigious honor society due to my academic excellence, pronounced interest in the field of neuroscience, and commitment to impactful community service.