



NAIADEL

Neurocomputation • Adaptive Intelligence
Agency Dynamics • Embodied Learning

Adaptive Intelligence Across Biological and Artificial Systems

Mechanism-based | Interdisciplinary



MEET THE NAIADEL LAB

A space where science & fellowship converge



MISSION

We study how adaptive intelligence and agency emerge, are sustained, and break down across neural, psychological, computational, and social scales – and how these processes shape learning, decision-making, reasoning, and mental health.



PURPOSE

To build a mechanistic science of adaptive intelligence and agency with translational reach into mental health, human flourishing, and the design of agentic artificial systems and adaptive environments.



RESEARCH PHILOSOPHY

Central to our research are the mechanisms of meta-learning and meta-control: the processes by which systems regulate their own learning and dynamically select, switch, and restructure control strategies. We view adaptive intelligence as an emergent property of these hierarchical mechanisms. They give the capacity to regulate learning and to infer, acquire, relinquish, and restructure control in response to changing environments, orienting behavior toward purpose. It is precisely this active restructuring that makes agency more than inference: systems enact their purposes by reshaping the environments that in turn shape them.



VALUES

Mechanisms First | Multi-scale | Adaptive Growth |
Empowering | Human-Centered | Translational



SELECTED RESEARCH QUESTIONS

- How do humans infer controllability under uncertain, changing demands?
- How does stress and volatility guide meta-control and adaptive learning?
- How do humans and AI systems co-adapt over time?
- How do adaptive mechanisms and emerging agency dynamics differ across psychopathologies?



METHODS

We combine human behavior, neural data, computational models and agentic AI to understand how intelligent systems adapt, learn, and thrive in naturalistic, dynamic environments



Experimental
Environments



Physiological
Recordings



Computational
Analyses



agentic AI
Modeling



Understand
Adaptive
Intelligence



LAB CULTURE

NAIADEL is built on fellowship rather than transaction – a community of minds united by shared intellectual purpose, reciprocal investment, and the conviction that meaningful knowledge is built together. We cultivate a co-constructive culture in which every member is both learner and teacher, both apprentice and architect. We value agency, curiosity, integrity, and adaptive growth not as abstract principles, but as lived practices. Here, people are not contributors to someone else's vision, but co-authors of an evolving scientific ecosystem shaped through shared responsibility, trust, and discovery.

Members contribute from day one, build skills, and gain ownership as their research independence grows.



CONTRIBUTE TO THE NAIADEL LAB

Join a collaborative ecosystem of discovery



We are looking for highly motivated postdocs, graduate, and undergraduate students, post-baccs, and research assistants to join our journey on cutting-edge interdisciplinary research in:

Computational neuroscience | Computational psychiatry
Cognitive-affective science | Human-AI dyadic interactions



RESEARCH OPPORTUNITY

Members receive training in and contribute to:

Computational & Modeling Methods

- Computational cognitive modeling (e.g., DDM, RL)
- Machine learning and deep learning on behavioral and longitudinal data
- Multi-modal joint modeling of physiological data (EEG, eye-tracking) and behavioral data
- Digital phenotyping and adaptive intervention design

Experimental & Data Methods

- Statistical analyses of experimental game paradigm data
- Statistical and ML analyses of clinical and questionnaire data
- Text-based sentiment and LLM analyses to study agency dynamics
- Adaptive game-based paradigm design and serious games

Scientific Infrastructure

- Scientific programming in Python and R
- Experimental design and adaptive digital platforms
- Human-AI interaction and adaptive systems

The lab provides access to rich existing datasets, ongoing projects, and collaborative pipelines



WHO SHOULD APPLY?

We welcome members who are:

- Intellectually curious and self-driven
- Committed to reciprocal collaboration
- Excited to work across neuroscience, psychology, computation, and AI
- Interested in mechanism-based and translational research
- Comfortable with, or eager to learn, quantitative methods

NAIADEL is a highly quantitative and computational lab. Experience with programming, statistics, or computational modeling is highly valuable, though motivated students eager to learn should apply too.



WHAT MEMBERS GAIN

- Rigorous mentorship and genuine intellectual partnership
- Hands-on experience with quantitative methods
- Access to rich multimodal datasets
- Opportunities for conference presentations and publications
- Co-authorship in an evolving research ecosystem – not just assistance
- Preparation for graduate school, research, or industry careers in computational science

JOIN THE NAIADEL LAB

If our vision resonates with you, we would love to hear from you.

Please email: nadjaging@arizona.edu

Subject line: NAIADEL Application

Please include:

- CV or resume
- Short statement of interests and experience (max ½ pages)
- Relevant projects, GitHub, papers, or portfolios (if available)

Full lab website and additional opportunities coming soon. In the meantime, you find more information about my work and research at gingjehli.com

Dr. Nadja Ging-Jehli

Incoming Assistant Professor, Cognition and Neural Systems,
Department of Psychology, University of Arizona

www.gingjehli.com