CoMP+AI LAB

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PSYCHOPATHOLOGY, ATTENTION, & INFORMATION

COMPUTATIONAL MODELING OF

CoMP+AI

Common student projects and tasks include :

- Generating experimental design ideas and finding or creating relevant stimuli
- Collecting data in-person and online
- Coding up new game-like experiments in various software platforms
- Testing, piloting, and debugging behavioral and eye-tracking experiments
- Conducting literature reviews of relevant scientific articles
- Analyzing data and producing written and visual summaries of results
- Writing and submitting conference abstracts and posters
- Writing up research projects for publication
- Participating in weekly research meetings with the other lab members
- Assisting with administrative research tasks

Research Program

The CoMP+AI lab uses cognitive-behavioral, computational, and physiological tools to predict and test models of psychiatric disease mechanisms. Specifically, we aim to identify patterns in how people use information from the world to make decisions, and to link those patterns to neural, cognitive, and computational mechanisms of healthy and disease-altered brains.

Research Questions

Lab research focuses particularly on how psychopathologies such as anxiety and compulsivity change the way people pay attention to, learn, and update information, and how those changes may produce symptoms we commonly associate with those psycho-pathologies. We ask questions such as:

- How do we decide what information we care about in a noisy, busy world?
- Does anxiety make us overfocus on certain goals or information and miss out on better opportunities?
- How does the context and framing of information impact our ability to learn and make good decisions?
- (how) Does being more tolerant of risk and uncertainty in the world make us better learners?

Research Methods

Student researchers in the CoMP+AI lab fully participate in designing and running experiments, data analysis, and scientific communication and presentation. As part of the lab, you learn and apply a variety of methods to investigate learning and information patterns in healthy and patient population data. Some of the methods we use in lab include:

- Behavioral experiments in-lab and online
- Neurocognitive and clinical questionnaires
- Computational modeling
- Machine learning data analysis
- Eye-tracking
- AI-integrating programming and model simulation

Collaborative Interdisciplinary Focus

Brain science, especially computational brain science, is a fundamentally interdisciplinary field. Students join the Comp + AI lab from majors and minors such as psychology, neuroscience, biology, data science, computer science, and others, and lab methods and research incorporate approaches from all these fields, as well as clinical science and psychiatry. While many student trainees choose to take leadership on a specific project or part of a project, most lab tasks and projects involve significant collaboration among lab members, or with members of other labs.

NEUROSCIENCE PROGRAM
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