

Artificial General Intelligence

Winter 2022

EECS 598-14

(1 credit version of 598-11)

John E. Laird

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Meeting Times: MW 1:30-3:00PM

Room: 1017 DOW

Credits: 1

Graduate only

Prerequisites: EECS 492/592 or permission of instructor

Non CSE graduate students encouraged.

This class will explore the computational structures and processes that can potentially support general intelligence. This will be a seminar course where students read, present, and discuss readings from AI and cognitive science, including psychology, linguistics, animal behavior, and neuroscience. Students will be evaluated on participation in class.

Planned topics:

- Potential definitions of intelligence and AGI: a topic we will return to throughout the semester.
 - Properties of tasks, domains, and embodiment that potentially require AGI.
- Different levels of analysis of intelligence including neural, cognitive, rational, and social levels.
- Animal mental capabilities, including problem solving, learning, language, socialization, ...
- Computational complexity analysis of different levels of intelligence.
- AI and human cognitive capabilities that are potentially necessary for general intelligence, including perception, categorization, identification, motor control, problem solving, reasoning, planning, metacognition, language, emotion, relational representations, social interactions, and many different forms of learning.
 - Analysis of evolved/innate vs. learned mechanisms vs. learning strategies.
- Alternative approaches to integrating mental capabilities, with an emphasis on cognitive architectures such as Soar, ACT-R, Spaun, Clarion, LIDA, Icarus, Sigma, and LEABRA, but also non-architecture approaches.
- Analysis of impact of different representation formalizations: neural, symbolic, ...
- Evaluation methods for AGI systems.
- Controversies over alternative approaches to AGI.
 - Why is AGI hard?
 - Is AGI impossible?
- Future approaches to AGI.