CS 4731/CS 7632 Game Artificial Intelligence

Semester and Academic Year: Summer 2026

Credits: 3 Credit Hours

Instructor Information

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General Course Information

Course Description

An exploration of how artificial intelligence is used in modern digital computer games.

Course Learning Outcomes

By the end of the course, students should be able to:

- Explain the role of artificial intelligence techniques in digital game design and development.
- Implement movement, navigation, path planning, decision-making, learning, and procedural content techniques for games.
- Analyze tradeoffs between optimal AI behavior and effective player experience.
- Build and evaluate AI behaviors within real-time game systems.

Required Course Materials

- No textbook is required; readings and assignment materials are provided through Canvas.
- Students need access to a Windows or macOS computer capable of running Unity and the required course development tools. Programming is primarily performed in Unity with C#; some assignments may use supplementary tools such as Python.
- Recommended: Artificial Intelligence for Games, Third Edition, Ian Millington and John Funge, ISBN-13 978-1138483972.

Grading Policy

- Module quizzes: 20% total
  - Per-module quizzes: Various, totaling 20%
- Individual assignments: 80% total
  - Grid Navigation: 10%
  - Path Network: 10%
  - Navmesh: 10%
  - A*: 10%
  - Projectile Aiming: 10%
  - Decision Making (Finite State Machine): 10%
  - Fuzzy Logic: 10%
  - Procedural Content Generation: 10%
- Undergraduates enrolled in CS 4731 have their lowest assignment dropped.

Assignment details, due dates, and final grading logistics are maintained in Canvas.

Late Policy

A 24-hour grace period is allowed for late submission with no penalty. Submissions are not accepted beyond the grace period unless institutionally approved.

Additional Criteria for Successful Completion

- Complete module quizzes according to Canvas instructions.
- Complete individual programming assignments as individual work.
- Submit work by the stated deadlines, subject to the course late policy and any approved accommodations.

Attendance and Participation

For on-campus sections, lecture attendance is recommended but not required. Asynchronous lecture materials are available. For OMSCS offerings, attendance is asynchronous.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the Georgia Tech Academic Honor Code. Suspected academic misconduct will be referred to the Office of Student Integrity. Students may discuss high-level ideas, but may not share code or detailed solutions unless assignment instructions explicitly allow it. AI-based assistance is treated like collaboration with another person. Assignment instructions may restrict AI use, and copied or uncited AI output is treated as plagiarism.

Student Conduct

Students and faculty are expected to maintain an atmosphere of mutual respect, acknowledgement, and responsibility consistent with Georgia Tech's Student-Faculty Expectations Agreement.

Accommodations for Students with Disabilities

Students with learning needs that require accommodation should contact the Office of Disability Services as soon as possible to discuss their needs and obtain an accommodations letter. Students should also contact the instructor so approved accommodations can be implemented.

Core IMPACTS

Not applicable.