

AI for Virtual Environments and Games – Topic Survey

Class Period: Monday P3

Location: TBD

Instructor

Jeremiah Blanchard

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Office Hours: TBD

Course Description

This course focuses on the development of artificial intelligence within the context of virtual environments and games. Topics include fundamentals of virtual environment and game design and interfaces as well as common topics in AI specific to such environments. Techniques covered include problem-solving algorithms, turn-based decisions, and behavioral / decision-making techniques used to develop agents as characters. Its focus is not just on developing intelligent systems but also those that develop user interest / engagement to enhance user experiences.

Course Pre-Requisites / Co-Requisites

Prerequisite: Knowledge of basic data structures (for programming assignments)

Course Objectives

By the end of the semester, successful students should be able to:

- articulate critical elements of environment and game design and how they are applied in practice
- implement recognized problem-solving algorithms to solve a well-defined problem
- describe how problem-solving algorithms can be applied as decision-making behaviors
- combine simple steering behaviors to create fluid agent movement
- design agent decision-making behaviors using common industry frameworks
- create systems that are tailored for human rationality and expectations

Required Textbooks and Software

There are no required materials for this course. All materials will be provided by the instructor. Programming assignments require a mobile computing device (laptop). Support is provided only for Windows 11.

Recommended Materials

- Artificial Intelligence for Games, Ian Millington, 2009, 2nd Edition, CRC Press
- The Art of Game Design: A Book of Lenses, Jesse Schell, 2014, CRC Press

Course Schedule

Day	Topics	Assessment (Daily)	Assignment Due
5/12	Syllabus, History of AI & Simulation	Syllabus Quiz (Q00)	-
5/19	Virtual Env. Design & AI Fundamentals	Q01	G00
5/26	Knowledge Representation, Basic Search	Q02	Ex0 (Review), G01
6/02	Optimized Search, Advanced Search	Q03, Q04	G02
6/09	Game Playing, Decision-Making	Q05	Ex1 (Search), G03
6/16	Steering Behaviors, Adv. Decision-Making	Q06, Q07	G04
6/23	Irrational Agents	Q08	Ex2 (Flocking), G05
6/30	ASYNCHRONOUS WORK WEEK		
7/7	HOLIDAY: TANABATA (七夕)		
7/14	Grad Topic Presentations, Adv. Topics	Q09	G06
7/21	HOLIDAY: MARINE DAY (海の日)		
7/28	Robocode Tournament	-	Ex3 (Robocode), G07

Grades

Assignment	Points	Grade Pct
Exercises (4)	8 x 4	32%
Quizzes (10-drop-1)	2 x 9	18%
Group Work (8-drop-1)	2 x 7	14%
Professionalism	2 x 1	2%
	100	100%

Grading Policy

Percent	Grade	Points	Percent	Grade	Points
93 – 100	A	4.00	73 - 76	C	2.00
90 – 92	A-	3.67	70 – 72	C-	1.67
87 – 89	B+	3.33	67 - 69	D+	1.33
83 – 86	B	3.00	63 - 66	D	1.00
80 – 82	B-	2.67	60 – 62	D-	0.67
77 – 79	C+	2.33	00 – 59	E	0.00

Excuses are evaluated per policy: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Exercises. Exercises are short, 1–2-week programming assignments intended to reinforce a fundamental AI programming concept. These assignments include review elements from previous courses and foundational content.

Quizzes. Students will take a short quiz each day on the content previous assigned reinforce that content.

Group Work. Each week, students will review assigned topics and complete assigned group work tasks. Deliverables will be developed by all group members together. (*cannot be completed individually*)

Professionalism & Expectations

Students are expected to adhere to the following guidelines in this course:

Read and adhere to the syllabus. Emails requesting information contained in the syllabus will receive the lowest priority for response with no guaranteed turnaround. Practically, this means responses will come only after the remaining email queue of the instructor is otherwise empty. This condition occurs approx. once every 24 months.

Students must act with honor; academic dishonesty will be strictly addressed. Sharing / copying, “borrowing” of code structure, discussing code structure, looking at code from another student, providing such code, and plagiarism, in addition to other dishonest behaviors, are considered academic dishonesty. No information regarding assignment solutions may be shared by students except at a conceptual level. If students implement algorithms from other sources, they must be cited. Students may not copy code from the Internet or other sources under any circumstances. Any student found to have violated these rules, whether a provider or receiver or unauthorized help, will be assigned a **grade of E (failing)** in the course and referred to the Honor Court. **When in doubt, ask.**

Grade reviews must be requested within one week of a grade being posted. After two weeks, no grades will be revisited. In the event of a grade review, the entire assignment will be reviewed.

All assignments are due by the time listed on Canvas. Projects and homework with a cascading deduction: one (1) weekday late for 10% penalty; two (2) for 25% penalty; or three (3) for 50% penalty. Quizzes and presentations may not be completed late for credit except with instructor approval for extenuating circumstances (see below).

Quiz, presentation, and meeting make-ups will not be permitted except in extenuating circumstances. For make-up consideration, a student must submit written documentation from a reputable source as evidence. For planned events (e.g., wedding), the student must contact the instructor at least two weeks in advance. There is no guarantee that requests will be accommodated. Events are taken into consideration strictly at instructor discretion.

Students should visit office hours for exercise help and grade questions. Do not send email to, send private messages to, or “@” instructors or TAs about project help or grades. TAs and instructors will try to answer questions in the chat when possible, but the way to get personalized help is to visit or make arrangements!

Please allow 48 business hours for a response by email. Remember that we will not respond to requests for exercise help or grades. Instructors and TAs have many responsibilities; they will respond to messages as is practical, but it can take some time, especially during the busy parts of the term.