

# AI Storytelling in Virtual Worlds

**Course numbers:** CS 7634 / CS 4803 / LCC 8823 MR

Monday/Wednesday/Friday 11:05 - 11:55

Van Leer C456

<http://www.cc.gatech.edu/~riedl/classes/2014/svw/>

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## Overview

Advances in artificial intelligence, 3D graphics, and understanding of narrative phenomenon have made it possible to begin thinking about and designing computational systems that reason about and manipulate stories. Why is this important? Narrative is a fundamental mode of cognition used by humans for communication, sense-making, entertainment, education, and training. Storytelling has recently gained popularity as a tool for motivating and engaging users in a variety of application domains. When computers start thinking in narrative terms---emulating human naturalistic modes of thought---amazing things can happen.

This class will explore the narratological and cognitive theories underpinning human narrative thought. It will survey the state of the art in artificial intelligence technologies that create and understand stories. Topics include:

- Narrative psychology
- Story understanding
- Story generation
- Discourse generation
- Media generation
- Interactive narrative and drama management
- Virtual characters (believability, personality, and emotion)

These topics will be examined through the lens of a host of application domains including:

- Computer games
- Education and training
- Virtual healthcare agents
- Computational journalism
- Human computation

## Expected Outcomes

At the conclusion of this class, students should have an appreciation for the importance of narrative reasoning in human intelligence and the complexity of creating technologies that reason

about, create, and understand narrative content in a range of serious and entertainment domains, including education, healthcare, training, journalism, and computer games. Students will be proficient in the implementation of artificial intelligence techniques that generate and manipulate narrative structures in practical domain.

## Prerequisites

Students are expected to have familiarity with artificial intelligence, preferably in the form of a previous class such as an introductory course on artificial intelligence. Students should be comfortable reading about and implementing AI algorithms.

## Course Structure

**Lectures:** The course will be conducted through lectures and participatory exercises. Students will be partially responsible for presenting the material in the course. The instructor may call on students to answer questions about the reading during lecture.

**Reading:** There is no textbook for the course. Reading assignments in the form of journal and conference papers will be made available to students in preparation for upcoming lectures. Students are expected to familiarize themselves with all reading material prior to the class in which the material is covered in lecture.

**Class Participatory Exercises:** A number of classes are reserved for participatory exercises wherein students are asked to accomplish a task within the class time period. Class participatory exercises may include rapid prototyping of technological solutions to a given problem or debates.

**Course Project:** There is a single, semester-long team project wherein the team must develop a functional system that uses artificial intelligence to generate narrative in a practical, real-world activity. Specifically, teams will be required to build a quest-generation game for mobile GPS-enabled platforms. Results of the class will be playable geo-location based Alternate Reality Games that adapt narrative quests to the individual preferences and choices of the player.

The project will be broken into three phases. In the first phase, the team will pitch a solution to the given quest-generation problem. In the second phase, the team will develop the parts of the system that do not require artificial intelligence—the game infrastructure and representative quest content. In the third phase, the team will develop to artificial intelligence quest-generation system. Projects will be demoed to the class during the last week of the semester, and final grading will occur during a one-on-one demo session with the course instructor.

Project grades will reflect the correctness of the artificial intelligence algorithm implementation and the degree to which the solution addresses the problem of quest generation in the context of an interactive gameplay experience.

**Project Critiques:** After each phase, each team will be randomly assigned to write a short report on other teams' proposed solution and project demo to date. The reports will require critical

thinking with regard to the extent that the other team's stated project plans and progress address the problem of quest generation in the context of an interactive gameplay experience.

**Writing Exercises:** Periodically students will be asked to draw general conclusions about reading material, compare-and-contrast different competing approaches to problems, or engage in pen-and-paper prototyping. These tasks will be conducted in the form of take-home written reports. Writing exercises replace conventional in-class tests, and must be prepared independently.

## Grading

Grades will be determined by (1) class participation, (2) lecture assistance, (3) critical writing assignments, and (4) projects.

- Class participation: 10%
- Written exercises: 30%
- Project: 30%
- Critical writing assignments: 30%

All assignments and projects will be graded by +/- letter grade. For projects and critiques, an 'A' will be earned by meeting or exceeding the average performance of the class on that assignment.

## Legalese

I expect you to understand and comply with the Georgia Tech Code of Conduct.

Making computer games is hard, and I encourage you to borrow art assets whenever possible. When borrowing art assets, please ensure you adhere to license obligations. Similarly, you may use code found on the Internet to enhance any aspect of your project that does not pertain to the artificial intelligence. Remember: this is an artificial intelligence class and all work on the artificial intelligence algorithms you use in your project must solely come from within one's team as your grade is primarily reflected on your ability to design and implement an artificial intelligence as part of your solution.

The instructor reserves the right to modify any of these plans as needed with advance notice; however, I won't do anything too drastic, and you'll be informed as far in advance as possible.