GAME 3150
Game Design Algorithms

Magy Seif El-Nasr
Outline of the Class

✦ Introduction of the Course
✦ Introductions
✦ Going over Syllabus
Introductions

Me!
Magy Seif El-Nasr

✨ Born in Cairo, Egypt

✨ Wanted to be a Surgeon
   (parents are both medical professors)
Magy Seif El-Nasr

👀 Took a Computer Graphics class in High School

👀 That was 1990

👀 Took my first class in CS in high school
I declared CS as my major at American University in Cairo (1991)

Directed in Theatre while studying
Magy Seif El-Nasr

✦ Master’s in CS at Texas A&M
✦ But studied psychology of emotions

Build believable characters
PROGRAMMING BELIEVABLE CHARACTERS for COMPUTER GAMES

• Learn how to develop human-like, complex game characters that will enhance the believability of your games
• Explore the behavioral aspects of non-player characters, including the psychological aspects of games theory, emotional computing, and agent architectures
• Delve into the design and programming of AI and intelligent agent architectures based on the most current research

Penny Bailie-de Vil

Game Development Series
Magy Seif El-Nasr

- Master’s in CS at Texas A&M
- But studied psychology of emotions

Build believable characters
Magy Seif El-Nasr

✧ So I went to do my PhD at Northwestern with Andrew Ortony and Ian Horswill

✧ To do this:

Build believable characters
Magy Seif El-Nasr

-but I was interested in how to create innovative experiences that engage so many people of different ages, and cultures
Magy Seif El-Nasr

- PhD in CS at Northwestern
- Study theatre and film

Innovative experience engaging a market
Magy Seif El-Nasr

For Games: everything matters

Level Design Concept

Texturing, lighting, Framing

Feedback visual/audio/haptic

Mechanics/how to lead player
Magy Seif El-Nasr

- For Games: everything matters

- Combat System
- Leveling up and progression
- Physics
- Sound
REAL-TIME CINEMATOGRAPHY for GAMES

- In-depth look at methods for adapting film techniques for use in interactive entertainment, including images and case-study examples
- Covers the principles of cinematography, lighting, editing, and sound
- Interviews with industry veterans in both film and games provide practical knowledge

Brian Hawkins
Current Projects

✧ Believable Characters and Interactive Narrative
Current Projects

✧ Game User Experience
✧ Games User Research Methodology
✧ GUR SIG Steering Committee
Current Projects

- Innovative Game Design (e.g., adaptive gaming, visualization to stimulate motivation)
Current Projects

✦ Game Camps
INTRODUCTIONS
You
1. Name
2. Major
3. Year
What have you learned so far at Northeastern?

Career Path
Games you played? Love? Hate?

Games you made? What you learned from them?
Game Trivia
Game Trivia
Game Trivia
Game Trivia

Were they trying to sacrifice you too?
Game Trivia
Game Trivia
Game Trivia
Game Trivia
Game Trivia

Capture
To capture this creature you must clear the grid of gems, matching them as if you were in a normal battle.

Done
Game Trivia
Game Trivia
Game Trivia
Syllabus

Take a look
Algorithms for Game Design

✧ Game logic Algorithms
✧ Graphics Algorithms:
  ✧ 3D graphics: rendering, transformation
  ✧ Scene management
  ✧ Collision detection in 2D and 3D
✧ AI Algorithms:
  ✧ Behavior Trees
  ✧ Planning
✧ Threading
✧ Networking
Teaching Method

✧ Learning by doing
✧ All concepts follow with labs
✧ Lots of time to apply concepts
✧ Focus on both:
  ✧ critical thinking, algorithmic thinking, working collaboratively, programmer challenges
  ✧ Algorithms and details
Books


  *(The book is in DirectX and uses C++ but the concepts are applicable)*

**Recommended:**

- Tom Miller and Dean Johnson. *XNA Game Studio 4.0 Programming: Developing for Windows Phone 7 and Xbox 360*, Addison-Wesley Professional, 2010.

- Aaron Reed. *Learning XNA 4.0: Game Development for the PC, Xbox 360, and Windows Phone 7*, O’Reilily, 2010.
Conduct

- No Cell phones or texts
- No facebook, twitter, etc. unless it is part of project work
- **Late:** more than 7 minute late 2% off
- **Attendance:** -5% for each class missed with no viable excuse
- Use of others’ code or assets need to be credited
Format

✧ Read chapters assigned before class
✧ First 30 minutes of class: discussion of the topic of the chapter
✧ Second 30 minutes: concept introduction
✧ Third 30 minutes: application of the concept and class assignment.
✧ *Recommended books should be used as supplements for the work you will do on the project and assignments*
Evaluation

Assignments: 50%
- Individual
- Some are in-class and others are take-home

Quiz: 20%

Project: 30%
- Group (2)
- 5 parts: pitch, engine assessment, iterations 3, final
- Each iteration is graded – prototype is graded
- Documents submitted allow you to go to the next stage
Homework

- Read Chapters 1 and 2 of McShaffry’s book.