HUM 2930-ALCR (25918) - Algorithmic Creativity

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Profile Link
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Location: Online
Day & Time: Tuesdays, 12:50 PM – 3:50 PM EST
Office Hours: Tuesdays, 11:50 AM – 12:50 PM
Course Link

Course Description

This course explores computational creativity and algorithmic methods, including machine learning, natural language processing, and generative adversarial networks, to create diverse outputs such as text, images, music, and video. Students will learn foundational computational techniques like formal procedural methods, grammars, probabilistic automata, and neural networks to analyze and generate generative art, sound, and performances.

Emphasis is placed on programming environments like p5.js, GitHub for version control, and VS Code, fostering hands-on experimentation within a critical aesthetic and ethical framework. Students will develop their skills in algorithmic and generative art, learn to critique the cultural impacts of computational creativity, and collaborate on interdisciplinary projects.

Course Goals

- Understand the history and modern applications of computational creativity.
- Learn tools and techniques to create generative art, music, and multimedia performances using AI.
- Develop collaborative strategies for interdisciplinary creative projects.

Learning Outcomes

By the end of the course, students will:

- Understand terminology for procedural design and generative art.
- Demonstrate foundational programming concepts: variables, loops, objects, functions, and arrays.
- Create web-based multimedia works incorporating interactivity and generativity.
- Co-create original computational creativity projects.

- Critically analyze and discuss creative and ethical implications of algorithmic systems.
- Collaborate effectively with peers from diverse disciplinary backgrounds.

Course Schedule and Topics

- **Week 1:** Introduction to Computational Creativity and Generative Art
- **Week 2:** Generative Visual Art I - Chance Operations, Chaos, and Complexity
- **Week 3:** Generative Visual Art II - Vectors and Forces
- **Week 4:** Generative Visual Art III - A-Life and Cellular Automata
- **Week 5:** Generative Sound - Oscillators and Beyond
- **Week 6:** Generative Visual Art IV - Particle Systems and Autonomous Agents
- **Week 7:** Physics and Matter
- **Week 8:** Fractals and Generative Grammars
- **Week 9:** Evolutionary Computing and Genetic Algorithms
- **Week 10:** Rule-Based Systems and Markov Chains
- **Week 11:** Computational Cognition - Neural Networks and Perceptrons
- **Week 12:** Neuro-Evolution and Reinforcement Learning
- **Week 13:** Generative AI - LLMs, GANs, and p5.js Applications
- **Week 14:** Cross-Disciplinary Integration
- **Week 15:** Final Project Showcase & Critiques

Required Course Materials

- **Access Tools**: Canvas, GitHub, Slack
- **Hardware**: Laptop (Mac or PC), flash drive or Google account
- **Software**:
  - p5.js (https://p5js.org/)
  - p5.js Online Editor (https://editor.p5js.org/)
  - ML5.js (https://ml5js.org/)
  - Tone.js (https://tonejs.github.io/)
  - Visual Studio Code (https://code.visualstudio.com/)

- Replicate (https://replicate.com/)

Recommended Reading List

- **Books**:
  - Shiffman, Daniel. *The Nature of Code 2*. No Starch Press, 2024.
  - Whitelaw, Mitchell. *Metacreation: Art and Artificial Life*. MIT Press, 2006.
  - Veale, Tony & F. Amilcar Cardoso, Editors. *Computational Creativity: The Philosophy and Engineering of Autonomously Creative Systems*. Springer, 2019.
  - Machado, Penousal et al. *Artificial Intelligence and the Arts*. Springer, 2021.
  - Brown, Oliver. *Beyond the Species: Making Machines That Make Music*. MIT Press, 2021.
- **Industry Resources**:
  - ISEA Archives
  - SIGGRAPH
  - Ars Electronica Archive

Evaluation

- **40%**: In-Class Coding Exercises
- **40%**: Final Project
- **10%**: Documentation
- **10%**: Participation

Expectations and Attendance Policy

Students are expected to attend all classes, participate actively, and dedicate 2–4 hours per week on readings, projects, and experimentation. Regular Canvas and Slack check-ins are mandatory.

Students are allowed **2 unexcused absences**. Additional unexcused absences will result in a **10% deduction** per absence. Excused absences require proper documentation.

Academic Integrity

UF students are expected to abide by the Honor Code, ensuring all work submitted is original and properly cited. Plagiarism or unauthorized aid will result in disciplinary action.

This course combines technical exploration with creative and ethical inquiry, fostering innovation in computational creativity. Push your boundaries, experiment boldly, and collaborate meaningfully!