Digital Media Workshop

Experiments in ARTifical Intelligence

art with machines

Years taught: Fall 2021, 2022
[background: Urmwelt, 2018 by Pierre Huyghe - segment]

ART 4612C/6925C Digital Media Workshop [cross-listed with ART4828C] is a revolving topics, studio workshop. This semester we will explore ARTifical Intelligence. We will learn about the history and theory of AI in computing from a scientific, mythological, and material viewpoint. We will investigate it from a “pharmacological” position that is deeply critical, yet simultaneously analytical with regard to its potential. Not only will we gain a literate understanding of AI, but we will learn “theoretically”: we will learn through the act of making. Students will materially engage AI as a medium for the production of art works. Experience with digital image practices, computer modeling and programming are recommended, but not required.

The class is a hands-on, art studio, experimental workshop. It is project-based and students will propose work that explores their own practice using artificial intelligence as a medium or source of inspiration. Sample project ideas include but are not limited to: simulations, networked experiences, generative audio, generative imagery (still and motion), info-viz, general research, etc.

As a Senior-level and Graduate-level course, you develop your own project ideas (with our help). Your primary task is to challenge your own abilities and push the boundaries of your current knowledge.
Digital Media Workshop

Experiments in ARTificial Intelligence

art with machines

Years taught: Fall 2021
[background: Uumwelt, 2018 by Pierre Huyghe - segment]

Credits: 3: Prereq: ART 2620C (Net Art) or with permission of faculty.

Jack Stenner, Ph.D
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Office: FAC 304
Office Hours: Th 11:30am-12:30pm
352.213.0997
stenner@ufl.edu

Undergraduate: ART 4612c Section 11633
Graduate: ART 6925c Section 11699
Class: PHYSICAL – Fine Arts Bldg C Room 302
Time: T/Th 8:30AM – 11:30AM
Website: http://jackstenner.com/teaching/ai
Listserv: Class contact will be made UF email and via Discord (evite to be placed in UF email)
Objectives

Over the course of the semester, the goal is to help you develop your art practice in the following ways:

1. **Context**
   - Become aware of the history and material foundation of AI.

2. **Synthesis**
   - Learn the appropriate integration of digital processes.

3. **Criticality**
   - Engage meaningful discussion and develop criticality.

4. **Awareness**
   - Gain an awareness of related work in the field.

5. **Communicate**
   - Propose ideas in a way that clearly demonstrates intent.

6. **FUN**
   - Have FUN!
Grades will be based 90% on projects, reviews, and class assignments. 10% will be based on class participation. See below for the breakdown. Participation means you are expected to constructively criticize your peers and participate in class discussions. Failure to do so will impact your participation grade.

Detailed, specific info on grades and grading can be found at:
https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

Notwithstanding the description of grades above, generally, grades are conceived in this way:

**A(Excellent)** Student's work is of exceptional quality and the solutions to problems show a depth of understanding of the program requirements. Project is fully developed and presented well both orally and graphically. Student has developed a strong and appropriate concept that clearly enhances the overall solution. The full potential of the problem has been realized and demonstrated.

**B(Good)** Student's work shows above average understanding and clear potential. All program requirements are fulfilled and clearly and concisely presented.

**C(Fair)** Student's work meets minimum objectives of course and solves major problem requirements. Work shows normal understanding and effort. Quality of project as well as the development of knowledge and skills is average.

**D(Poor)** Student's work shows limited understanding and/or effort. Minimum problem requirements have not been met. Quality of project or performance as well as development of knowledge and skills is below average.

**F(Failure)** Student's work is unresolved, incomplete and/or unclear. Minimum course objectives or project requirements are not met, and student's work shows lack of understanding and/or effort. Quality of project or performance is not acceptable.

Instructor's evaluation of student's interest, motivation, attendance, proficiency and overall development or improvement during the semester will be taken into consideration in determining the final course grade. This syllabus is subject to refinement and development throughout the semester based on feedback and class interaction. Policies and grading criteria are absolute and will not change. Any substantial changes will be discussed with the class prior to implementation.

**Grading breakdown:**

<table>
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<th>Component</th>
<th>Percentage</th>
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<tr>
<td>Assignments (5)</td>
<td>50%</td>
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<tr>
<td>Reflections (10)</td>
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<tr>
<td>Final Project</td>
<td>20%</td>
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<tr>
<td>Participation</td>
<td>10%</td>
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Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Despite what some lunatics might say, Covid-19 is STILL a problem. We are required to meet in person this semester, but thankfully there is a vaccine. Please get one! You MUST, at a minimum, follow UF Covid-19 Guidance as a member of this community.

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

Readings will consist of .pdfs and URLs available on the class website. While not required, I highly recommend Atlas of AI by Kate Crawford.

Projects
Experiments in ARTificial Intelligence Schedule

return to course

AI Schedule 2022
Thursday 08.25

Week 1: Introduction and Setup

Content:
- Syllabus Review
- Intro to Experiments in ARTificial Intelligence
- Intro to Art, Artists and AI
- SCREEN: Naked AI

Assignment:
Complete the reading(s) below and post reflections on Canvas (due: Tuesday, Aug. 30.)

BOOKMARK: UF LinkedIn Experiments in ARTificial Intelligence Playlist
- Sign up for DALL•E 2 Preview HERE
- Join Midjourney Discord. See instructions HERE
- Join Class Discord. Link provided in class.
- Research the work of Heather Dewey-Hagborg and prepare questions.

Readings:

Tuesday 08.30, Thursday 09.01

Week 2: What is AI? History of Machine Intelligence

Content:
- Discuss reading(s) assigned last week.

HiPerGator Training: Go to UF Coursera Training and take HiPerGator Account Training (due: Tuesday, Sept. 06). More info HERE but you MUST take the Coursera course.

WATCH: UF LinkedIn Experiments in ARTificial Intelligence Playlist - Unix Essential Training
- Experiment with Midjourney and DALL•E 2 - post favs to class Discord.

REQUIRED: Attend Visiting Artist Heather Dewey-Hagborg’s talk tonight at 6:15PM

Assignment:
- Complete the reading(s) below and post reflections on Canvas for discussion next week.

BE SURE YOU’VE completed the Unix tutorial AND the HiPerGator Training

Readings:

Tuesday 09.06, Thursday 09.08

Week 3: Art, Artists and AI

Content:
- Discuss reading(s) assigned last week.

SCREEN: Coded Bias

STUDIO: BASH Terminal + HiPerGator setup, Development Environment Configuration

DEMO: Introduction to AI techniques

Slides for Research Computing Orientation.

FYI: I added a ZSH Setup overview on my Teaching Support forum: HERE

Assignment:
- Complete the reading(s) below and post reflections on Canvas.
- Assignment 1: Experiment with Midjourney and DALL•E 2, prepare for CRIT, post reflection to Canvas.

Readings:
Week 4: Image Classification 1

**Content:**
Discuss reading(s).

**CRIT:** Assignment 1 - Midjourney/DALL-E 2 experiments.

**SCREEN:** *Lo and Behold: Reveries of the Connected World,* by Werner Herzog
Intro to p5.js and m15.js
Learn to implement basic image classification using existing machine learning models.

**Assignment:**
Complete the reading(s) below and post reflection on Canvas.
Assignment 2 - Create a network-based artwork using p5.js that incorporates still imagery, video and, optionally, some form of interaction.

**Readings:**

Week 5: Image Classification 2

**Content:**

FIELD TRIP: Tour of HiPerGator AI at UF High Performance Data Center (Tuesday)
Discuss reading(s).

**CRIT:** Assignment 2 - p5.js artwork
Saving and loading training models, exploring multiple techniques.
Google Colab and Jupyter Notebooks and using them with HiPerGator

**Assignment:**
Assignment 3 - Image Classification Artwork 1

**Readings:**
None

Week 6: Object Detection, Computer Vision

**Content:**

CRIT: Assignment 3 - Image Classification Artwork 1
Learn to implement Object Detection.

**Assignment:**
Complete the reading(s) below and post reflection on Canvas.
Assignment 4 - Create an artwork using Object Detection

**Readings:**

Week 7: Transfer Learning

**Content:**
Discuss reading(s).
Tuesday 10.11, Thursday 10.13

Week 8: Working with TEXT

Content:
CRIT: Assignment 4 - Object Detection Artwork (Tues/Thurs)
Learn about Sentiment Analysis, GPT2, Text to Image, Word2Vec, etc.
Assignment:
Complete the reading(s) below and post reflection on Canvas.
Assignment 5 - Create an experimental AI artwork.
Readings:

Tuesday 10.18, Thursday 10.20

Week 9: Working with a Supercomputer

Content:
Discuss reading(s).
How to work with UP’s HiPerGator: Step by Step
Begin to work with HiPerGator and Jupyter notebooks: Disco Diffusion, VQGAN, etc.
Is Cryptocurrency the Magic Bullet for Social Change?
Assignment:
Continue development of Assignment 5 - Experimental AI artwork
Readings:
None

Tuesday 10.25,

Week 10: Disco Diffusion - Stills

Content:
Learn about text to image or CLIP-guided diffusion systems.
Prompt engineering, parameters, models.
Assignment
Complete the reading(s) below and post reflection on Canvas.
Continue development of Assignment 5 - Experimental AI artwork
Readings:
Agostinelli, Erika. "I Don't Trust AI: The Role of Explainability in Responsible AI." Erika Agostinelli, April 1, 2021.
Women in Data Science, Bristol 2021 - Agostinelli Crowdcast begins at 1:13:19

Tuesday 11.01, Thursday 11.03

Week 11: Disco Diffusion - Stills

Content:
Tuesday 11.08, Thursday 11.10

Week 12: Disco Diffusion - Animation

Content:
How to create animations with Disco Diffusion
STUDIO - Experiment with techniques, develop project
Assignment:
Develop your final project, EXPERIMENT!
BEGIN: Final Project, brainstorm and prepare to present concept in class on Tuesday.
Complete the reading(s) below and post reflection on Canvas.
Readings:

Tuesday 11.15, Thursday 11.17

Week 13: EXPERIMENTS

Content:
Review Final Project concepts.
STUDIO - Develop AI Final artwork.
Assignment:
Continue work on Final Project - AI artwork
Readings:
VOGAN+CLIP — How does it work?
VOGAN+CLIP github
Make your own AI generated movies with VOGAN+CLIP (YouTube)
List of VOGAN+CLIP Implementations

Tuesday 11.22, Thursday 11.24

Week 14: AI EXPERIMENTS - NVIDIA Jetson

Content:
DEMO: NVIDIA Jetson Nano
Assignment:
Continue work on Final Project - AI artwork
Complete the viewing below and post reflection on Canvas.
Readings:

Tuesday 11.29, Thursday 12.01

Week 15: AI EXPERIMENTS - NVIDIA Jetson

Content:
Experiment with NVIDIA Jetson Nano
Content:
**DEMO:** NVIDIA Jetson Nano

Assignment:
Continue work on Final Project - AI artwork
Complete the viewing below and post reflection on Canvas.

Readings:

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Tuesday 11.29, Thursday 12.01

**Week 15: AI EXPERIMENTS - NVIDIA Jetson**

Content:
Experiment with NVIDIA Jetson Nano
**STUDIO** - Develop your Final Project

Assignment:
Continue work on Final Project

READ: The Illustrated VQGAN

Readings:
None

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Tuesday 12.06

**Week 16: AI EXPERIMENTS**

Content:
STUDIO - Develop Final Project
**NFT Discussion at Art Basel Miami**
New Study on NFTs Deflates the "Democratic" Potential for the Medium

Assignment:
FINISH work on Final Project

Readings:
None

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Friday 12.16

Exam Week: Final Exams - UF Official Exam time: 7:30AM - 9:30AM.

**FINAL CRITIQUE:** Black Box
ARTificial Intelligence Resources

back to Experiments in ARTificial Intelligence
back to Full Luxury AI

My Support Forum
ARTISTS

Artists who incorporate artificial intelligence in their practice.

im here to learn so ((( ]] )]] by Zach Blas

Use the filters to narrow your focus on specific topics.
Return to ARTificial Intelligence Resources

The artists below are dynamically retrieved from my bookmarking application. Please feel free to send links to artists you think should be included.

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THEORY

Some of the ways we think about it.

from Silver Peak Lithium Mine by Kate Crowford.

Use the filters to narrow your focus on specific topics. Return to ARTificial Intelligence Resources

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## Tutorials

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