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Artificial Intelligence and Art: A University Curriculum Course for Undergraduates

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***Abstract*— This paper describes a new course entitled "AI & Art" offered at Quinnipiac University in the spring of 2023. In this course students used text-to-image AI generators to create artwork, learned to write prompts using ChatGPT, and wrote short essays on critical issues and topics implicated by the rise of AI image-generation software. This course fosters essential learning outcomes such as critical thinking, creativity and hands-on experience with cutting-edge AI technology preparing them for 21st-century careers and citizenship.**

Keywords—Artificial Intelligence, AI, text-to-image generation, ChatGPT, AI Detection, Critical Thinking, Art, DALL*E2, Midjourney, Open AI, Stable Diffusion

I. Introduction

AR250*DA was first offered in the spring of 2023 as a special topics course at Quinnipiac University [1], which satisfies a breadth requirement of the required undergraduate curriculum. Students began working with Open AI's DALL*E2 [2] followed by Midjourney [3], an even more powerful text-to-image generator. A key part of this course is for students to learn how to write effective prompts to input to the AI to achieve the desired visual output. Students also experiment with ChatGPT [4] to help them generate prompts. Students write short responses to critical questions such as in the age of AI-generated art "What is art?", "What is creativity?", "How can you tell if an artwork is AI generated?", "Should artists be afraid of AI-generated art?", "Deep Fakes", "Is there gender or racial bias in AI image generators?" etc.

This new course covering the recent Artificial Intelligence text-to-image generation software will empower graduates to successfully navigate the 21st century. Such innovative courses match the mission of higher education evolve to provide pathways that not only spark creativity, problem-solving and critical thinking, but also support students and faculty as they incubate new ideas in supportive environments. Higher educational institutions as the gateways to both innovation and to an educated workforce.

II. Sample Student Work

Throughout the semester students explore how to write different text prompts to generate specific image genres such as self-portraits, portraits, still life, landscapes, figure poses while exploring different rendering styles such as photo realistic, animé, silk-screen, painterly, impressionistic and/or expressionistic. Examples of student work follow:

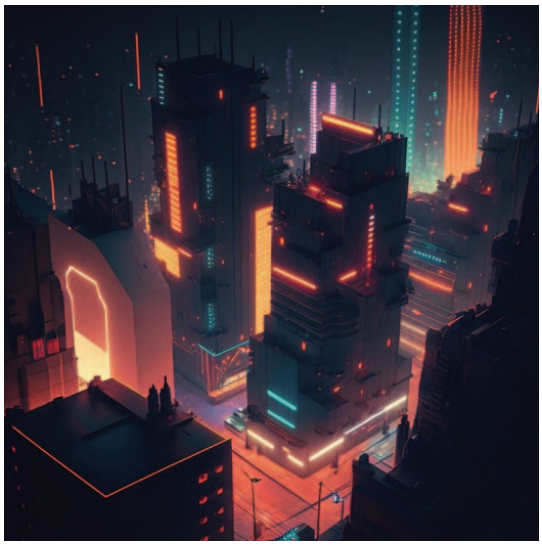

Fig. 1. Generated image based on prompt written by Horacio Valdes: *Cyberpunk type city scape with neon lights 3D game*

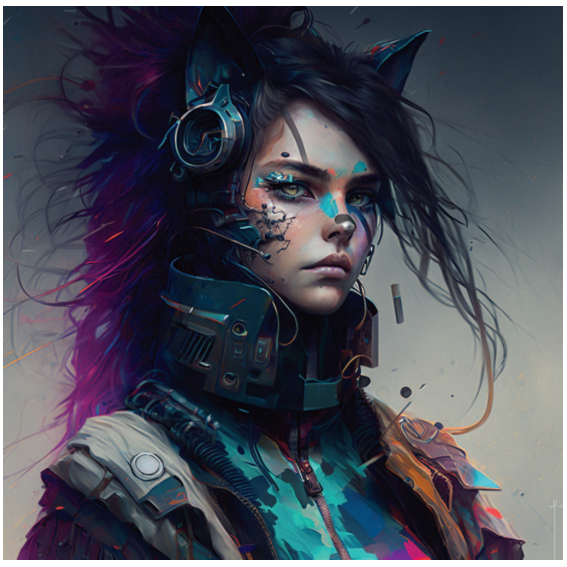

Fig. 2. Generated image based on prompt written by Brendan Berg: *Chat GPT personified, clothing based off AI, colorful, gloomy, almostic robotic figure, realistic, portrait*

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Fig. 3. Generated image based on prompt written by Jenna Hallam: *Ladybug: An extreme close-up vibrant photograph of a ladybug sitting on a leaf with raindrops around it. aspect 2:3 --chaos 0 --stylize 250 --quality 1 --seed 12345*

III. The Text-To-Image Generation Software

The following text-to-image generation software was introduced for students to use to complete assignments.

A. Open AI's DALL*E2

DALL*E2 is an artificial intelligence program created by OpenAI that can generate original images and artwork from text descriptions by combining concepts, attributes, and styles. It was introduced by OpenAI in January 2021 and is available as a browser-based tool. DALL*E2 can create highly realistic images of various objects, animals, and even abstract concepts like emotions or textures. The user can enter a text description like "an astronaut riding a horse in photorealistic style," and DALL*E2 can generate an image based on that description.

B. Midjourney

Midjourney is considered one of the best AI image generators and produces high-quality results. However, unlike other image generators that offer web apps or downloadable software, Midjourney can only be accessed through Discord [5] the social media site popular among game developers. To generate an image with Midjourney, users need to type "/imagine" or choose "imagine" from the menu, which opens a prompt field where they can type a description of the image they need. After entering the description, Midjourney generates and displays four versions of the generated image on Discord. Each image can be upscaled or new variations can be generated.

In addition, demonstrations were given of playground.ai [6] (using Stable Diffusion 1.5 and 2.0) and Stable Diffusion Online [7].

IV. The University Catalog

A. The Course Code

The new course "AI & Art" was listed in the University Catalog under the Studio Arts Program using the course code of AR250*DA. AR references "art" and 250 indicates this course is suitable for sophomores and above. "DA" is the designation used to indicate an online course.

B. The Catalog Course Description

The University Catalog Course description of AR250*DA AI & Art is as follows:

Artificial Intelligence text-to-image generators have recently exploded in popularity. In this course, you will learn about and use some of these new and powerful tools to create novel AI-assisted art. We will take a look under the hood at the AI that makes it all possible and discuss the implications of this technology concerning artistic originality, ethics, copyright and the emergence of deepfakes.

C. . The University Curriculum

As a studio arts class AR250*DA AI & Art, satisfies one three credit, Fine Arts Course requirement as part the mandated breadth and depth requirements of the State of Connecticut, Department of Higher Education.

V. Essential Learning Outcomes

A Quinnipiac University education provides students with both specialized knowledge of a discipline, and a broad understanding of human cultures and the physical and natural world. Quinnipiac graduates can integrate and apply knowledge from multiple perspectives found inside and outside of the classroom. They have a sufficient command of key forms of literacy, as well as the requisite intellectual, social, and personal skills and understanding, to identify and respond effectively to contemporary problems. Quinnipiac graduates demonstrate a number of key outcomes essential to the life and practice of a responsible, educated citizen, consciously and decisively. Graduates acquire these Essential Learning Outcomes (ELOs) through a purposeful integration of the University Curriculum, requirements within one's major, and co-curricular experiences.

The course will touch on multiple outcomes but especially promotes the following outcomes: critical and creative thinking, inquiry and analysis, and effective communication. We will also touch on: knowledge and literacies, social and emotional intelligence, and intercultural citizenship.

A. Course Learning Objectives

In this course:

1. Students will articulate and define their goals for working with AI image generation.
2. Students will learn the very recent history of generative art.
3. Students will engage in effective communication by making use of their writing, and critical thinking skills for reading responses and writing prompts and learning

how to express their ideas clearly and succinctly in order to write effective prompts.

4. Students will learn how to effectively use AI text generation while maintaining their own "human" voice.
5. Students will learn about the underlying technologies of neural nets, image generation and LLMs.
6. Student will apply their information fluency and visual literacy through learning important terms and concepts from film, photography, the history of art, contemporary art, influential artists, artistic styles, design and illustration, lighting, computer graphics and related fields in order to write effective prompts.
7. Students will develop their social intelligence and diversity awareness and sensitivity by learning how to conduct effective and positive critiques through constructive criticism that help others improve their work.
8. Students will engage with intercultural awareness and responsibility through the exploration and engagement with the issues and controversies of these new technologies.
9. Students will create a portfolio of work that showcases their hands on knowledge of these new AI Tools.
10. Students will gain working knowledge of writing prompts and using DALL*E2, MidJourney, Stable Diffusion and other AI text-to-image generation software.

B. Course Organization

During each class meeting students discuss the written reading responses, critique work, explore, test and use different prompts to generate artwork and address stylistic issues and genres. Each class meeting on Zoom will be organized roughly as follows (with room for improvisation of as needed!).

C. Flipping the Classroom:The Pilot & Navigator

The pilot & navigator model is employed to "flip the classroom." The supervising faculty instructor 'pilots' this course, but students will serve as the navigators. In other words, students will select from suggested topics that they are interested in to write about for each class meeting response and for each short report that they will present in class as well as the subject matter that they wish to focus on for generating their artwork.

Since the AI landscape is changing so quickly the pilot (the instructor), must accordingly adjust the course content and topics. Students are encouraged to share their feedback and recommendations as they learn more about new and exciting developments that occur weekly in the AI image generation space. Students are actively encouraged to navigate by suggesting topics for investigation, providing links to articles, papers and other resources that they discover relevant to the course.

D. Assignments)

Students are given the following assignments requirements to complete during this course.

- Attendance
- Portfolio PowerPoint and Final Presentation to the class
- Homework consisting of: Image Generation (at least 6 images per week)
- Written Reading Responses
- 1 Short (Expert) Report
- Prompt Sharing (blog posting)

E. Portfolio PowerPoint Presentation

The portfolio PowerPoint will be an ongoing collection of student's best work produced during the semester. Throughout the duration of the course students will be adding their generated images to their PowerPoint slide deck. Each week students will be generating at least 6 images. Along with posting each image students include the name of the AI software and the prompt used to generate the image.

At the end of the semester, during the final class meeting of the semester, each student gives a 3–4 minute presentation of their portfolio PowerPoint containing their best images. Latitude is given for alternate types of final presentations including doing Zoom Recordings, TikToks, YouTube Videos, Podcasts, or using the new AI text to video generation tools.

F. Weekly Writing Responses

Each week students are given a short writing response assignment on topics covered each week. The postings should be a thoughtful, reasoned response to the current topic under consideration. The response should include citations as appropriate and evidence that the student has done the reading and is thinking critically about it. It should be a least 1000 characters in length.

G. Using ChatGPT and AI Detection Software

Each posting should be 'likely' written by a human, with a low percentage probability of being AI generated. AI Detectors such as Originality.ai [8], the Open AI Text Classifier [9] and GPTZero [10] are used for spot checks. If two or more AI detection reports indicate the text is likely written by AI students are required to rewrite their assignment.

The recommended workflow for the weekly writing short responses is as follows:

- Reading/viewing an article/video that pertains to the topics under discussion for the current Reading Response.
- Use ChatGPT or another AI text generator, to generate at least one paragraph or two consisting of at least 1000 characters on the topic.
- Students always have the option to write the Reading Response entirely by themselves.

- Repeat with a new prompt to improve results as needed.
- Use Quillbot or Grammarly (or both) for revisions.
- Students are encouraged to add their own personal edits and should add citations and sources as appropriate.
- Use an AI Detector to make sure that their text is at least "51% likely to be written by a human.".

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H. Writing Response Topics

Each week students write at least 1000 characters addressing the following topics and questions:

- "What is art?"
- "What is creativity?" and "Can AI be creative?"
- "How can you tell if an artwork is AI generated?"
- "How to critique AI generated art?"
- "How does text-to-image AI work?"
- "Should artists be afraid of AI-generated art?"
- "Ethical issues, Intellectual Property and Copyright"
- "Deep Fakes"
- "Is there gender or racial bias in AI image generated art?"
- "What is the future of AI image generation software?"

In addition to the above topics, additional readings, Youtube videos, TikToks and other media sources are considered that report on the latest developments in the field.

I. Assessment

The following summarizes the weighting given to each assignment requirement:

TABLE I: GRADING

Requirements	% of Grade
Attendance, Participation	14%
Writing Responses	13%
Image Generation	40%
Short Reports	8%
Prompt Sharing	10%
Portfolio Project (Final)	10%
Portfolio Presentation	5%
Total	**100%**

VI. Inclusive Excellence

A. Diversity, Equity and Inclusion

In this course, a diversity of opinions and full participation of all students are encouraged. Students are reminded that reasonable people can and should disagree reasonably. It is expected that everyone will treat one another with civility and respect. There is the commitment to maintaining an environment in which all members are treated equitably, feel fairly represented, and are comfortable discussing topics, particularly controversial ones, with civility and open-mindedness. The University is committed to working to build a community of diverse individuals who can celebrate their differences while building on what everyone has in common.

All members of the community are asked to think about the work they are producing and ask themselves if they are consciously or unconsciously reproducing or reinforcing stereotypes, bias, or other elements that reinforce systemic racism, sexism, bigotry or other inequalities. Technology can change the world; students are encourage to use it in a positive way.

VII. Conclusions

A. Pros and Cons

AI text-to-image generation software makes it possible for someone with little or no training in fine arts or in photography to easily and quickly create stunning images filled with great detail. While this ease of use and accessibility is to be welcomed there is a downside of where traditional fine arts skills and the knowledge acquired through many years of experience is devalued. Hard-won skills and job opportunities are at the risk of being lost along with a critical assessment of quality.

However, the best examples of AI generated art are created by those fully immersed and knowledgeable in the visual language of art and photography. The most effective prompts 'artfully' use precise descriptions, invoke names of artists, reference history, specify lenses, film type, time-of-day, and lighting to achieve outcomes. An education in art history, in traditional fine arts, in photography is critical to understanding how to make effective use of this new technology.

Acknowledgment

AR 250*DA AI & Art was approved by Wesley Renfro, Associate Dean of the College of Arts and Sciences for deployment for the Spring 2023 Semester at Quinnipiac University, in Hamden, Connecticut.

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