



Course program and reading list

Semester 2 Year 2023

School: Efi Arazi School of Computer Science M.Sc.

Learning and Graphics Seminar: the Computer as a Content Creator

Lecturer:

Dr. Ohad Fried ofried@runi.ac.il

Course No.:	Course Type :	Weekly Hours :	Credit:
3958	Seminar	3	3

Course Requirements :	Group Code :	Language:
Final Paper	232395801	Hebrew

Prerequisites

Equivalent:

164 - Introduction to Computer Graphics

Prerequisite:

- 52 - Calculus I
 - 53 - Calculus II
 - 54 - Linear Algebra I
 - 55 - Linear Algebra II
 - 56 - Discrete Mathematics
 - 59 - Data Structures
 - 69 - Logic And Set Theory
 - 417 - Introduction To Computer Science
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Course Description

In this seminar we will learn about the computer as a content creator. We will cover topics ranging from image synthesis (e.g. DALL-E-2) to audio synthesis (e.g. AudioLM), with an emphasis on models that can generate content from a textual description.

Students will present papers each week, and the main goal is to have a prolific and fun discussion.

In case you are wondering, this is what ChatGPT thinks the course description should be: "Course Description: This seminar explores the use of deep learning techniques for generating images from textual descriptions. Students will read academic papers on various approaches to deep learning and their effectiveness in facilitating image generation. Topics include natural language processing, generative adversarial networks, deep convolutional generative models, and image captioning. Students are required to read and analyze academic papers on these topics and present their findings to the class."

Not bad! :)



Course Goals

- Understand recent methods for content creation using deep learning. The exact topic list is dynamic, as students choose the papers from a large list of options. Topics include:
 - Text2Image: how to create an image from a textual description.
 - Text2Video: how to create a video from a textual description.
 - Inversion & Prompts: how to convert an image or an object to their textual description.
 - Text2Object: how to generate 3D objects from a textual description.
 - Fine-grained Editing: editing specific regions or objects in images and video.
 - Image2Image: converting between different image domains.
 - Audio generation.
- Learn to critically read and evaluate research papers.



Grading

- Read, understand, and present a research paper to the class: 65%. Out of which:
 - Understanding (did the student grasp the main ideas and the details of the papers): 25%
 - Explanation (how well were the ideas conveyed to others): 25%
 - Presentation (slide quality, interaction, demos, question answering, etc.): 15%
- Review, in writing, two other research papers: 20%
- Other small tasks throughout the semester, such as reporting on the authors of a paper: 15%
- A bonus might be given for particularly complicated papers, exceptional class

participation, etc.



Reading List

Recent research papers. We will jointly finalize the list after the first week of class.