



# Course program and reading list

Semester 2 Year 2023

**School:** Sammy Ofer School of Communications M.A.

## Human-AI Co-Creation

**Lecturer:**

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| <b>Course No.:</b> | <b>Course Type :</b> | <b>Weekly Hours :</b> | <b>Credit:</b> |
|--------------------|----------------------|-----------------------|----------------|
| 2894               | Elective             | 2                     | 2              |

| <b>Course Requirements :</b> | <b>Group Code :</b> | <b>Language:</b> |
|------------------------------|---------------------|------------------|
| Final Paper                  | 232289401           | English          |

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### Course Description

The rapid advance in artificial intelligence (AI) results in the machines playing a gradually more proactive role in the content authoring process. Specifically, recent progress in 'deep' neural networks allows AI tools to generate synthetic realistic media content (such as the notorious 'deep fakes'), aiming to disrupt the content production pipeline in several industries. These examples also highlight some of the significant societal, ethical and organizational challenges that generative AI is posing including privacy, ownership, quality metrics and evaluation of generated content.

The course will first provide a historic and cultural overview of AI, with focus on synthetic content generation. The rest of the course covers technical topics, but it will be intended for a non-technical audience, with a combination of 'popular science' approach and hands on work, using easy-to-use tools. The students will learn the basic principles behind neural networks, including deep neural networks and specific methods such as convolutional neural networks. Next, the course will go more deeply into deep generative neural networks, including 'deep dream' methods, 'deep fakes', and generative adversarial networks (GANs), used to generate, for example, photorealistic images of people or objects that do not exist. We will also discuss sequence generation: natural

language (text), audio and video, covering methods such as sequence to sequence models and transformers. Finally, we will discuss the near term implications of the 'deep learning' revolution in specific areas related to the 'creative industries', as well as the potential social, cultural, and ethical implications of AI that is able to generate content, with focus on the role of humans in shaping the results.

This course is not an introduction to AI, and it does not assume background in computer science. The course will include hands on assignments, using either easy-to-use GUI software or running simplified snippets of code. In the latter case the process will be explained and supported for non programmers. Individual students with programming or computer science background will be encouraged to use code more extensively, and to submit a more technical final project.



## Course Goals

The goal of the course is to expose students to the "deep neural network" revolution, with focus on digital content creation and human-AI co-creation. By the end of the course the students will have a basic understanding of the underlying principles, with focus on networks that generate digital content, understanding the disruptive potential of these technologies as well as having realistic expectations for near and mid term developments. The students will gain some hands on experience in working together with deep generative neural networks to generate synthetic media content.



## Grading

Home assignments - 20%

Quizzes following video material self learning - 10%

Final Project - 70%



## Reading List

### **Mandatory**

LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. *Nature*, 521(7553), 436-444.

Winograd, T. (2006). Shifting viewpoints: Artificial intelligence and human-computer interaction. *Artificial intelligence*, 170(18), 1256-1258.

Burrell, J. (2016). How the machine 'thinks': Understanding opacity in machine learning algorithms. *Big Data & Society*, 3(1), 2053951715622512.

Dove, G., Halskov, K., Forlizzi, J., & Zimmerman, J. (2017, May). UX design innovation: Challenges for working with machine learning as a design material. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (pp. 278-288). ACM.

### **Additional Reading**

Grace, K., Salvatier, J., Dafoe, A., Zhang, B., & Evans, O. (2018). When will AI exceed human performance? Evidence from AI experts. *Journal of Artificial Intelligence Research*, 62, 729-754.

Manovich, L. (2018). AI aesthetics.

Boden, M. A. (1998). Creativity and artificial intelligence. *Artificial Intelligence*, 103(1-2), 347-356.