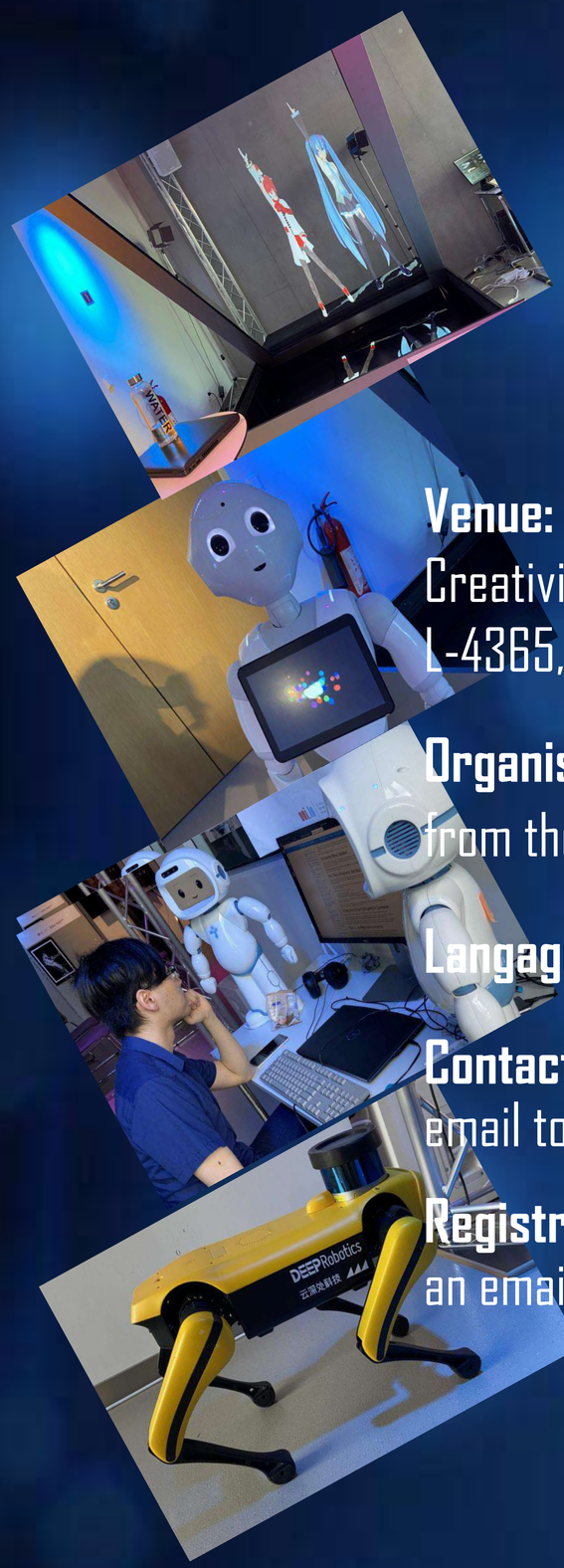


Venue: Maison du Savoir, Computational Creativity Hub (CCH), avenue de l'Université, L-4365, Esch-sur-Alzette, Belval

Organisers: Researchers and students from the university of Luxembourg

Langage : English/French

Contact: To contact us, please send us an email to sana.nouzri@uni.lu

Registration: To register, please send us an email to AIandArt@uni.lu

AS PART OF ESCH-SUR-ALZETTE EUROPEAN CAPITAL OF CULTURE

uni.lu FACULTY OF SCIENCE, TECHNOLOGY AND MEDICINE

HIGH SCHOOL WORKSHOP

Computational creativity AI&Art: Text, Image, Video, Dance, Music and Robot applications

October-November-December 2022

The high school workshop is part of the AI&ART pavilion project that was created in the Department of Computer Science under the Esch 2022 Activities

Workshop Program and Schedule

Aims

Our workshop aims at introducing high school students, those from the sciences and arts sections, to Artificial Intelligence (**AI**) and Machine Learning (**ML**) and the application/combination of these with Art, resulting in exciting interactive **AI&Art** projects. In the workshop, we'll explain the AI and ML techniques behind the applications and then the students will have the opportunity to explore these by themselves.

Training objectives

AI has become part of our conversations and our daily life. It frequently appears in the mass media, popular TV shows, and in online content. It is integrated in computers, tablets and in internet content. As AI researchers, we have the responsibility to inform and make the high school students understand what AI is and how it works. For this, we have chosen to combine AI and Art, we are convinced that this is the perfect combination to engage different high school students - of all ages, genders and backgrounds - and entice them to learn more and explore computational methods.

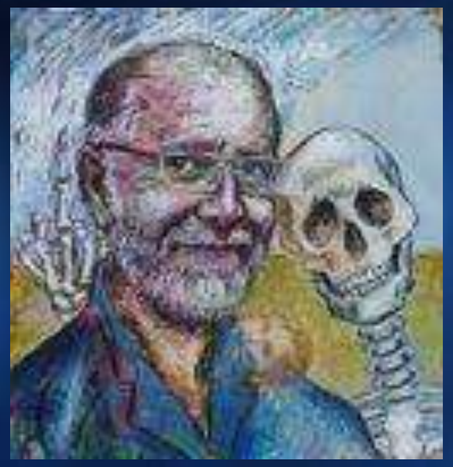
Organizer

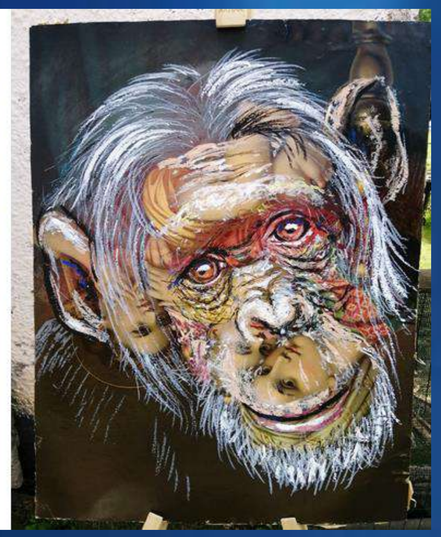
The organizer of the workshop is **Dr. Sana Nouzri**, Postdoc Researcher at the AI Robolab at the Faculty of Sciences, Technology and Medicine. She is an expert in AI & Art, with a strong interest in knowledge dissemination and outreach activities. Since 2020, she has been collaborating in the AI&Art project supported by Esch2022. First, she was responsible for the course "AI for artists" and collaborated in the training of artists on the key concepts of AI and ML, applied to art, which should lead to projects. She supervised then the most promising AI&Art project ideas with the support and additional programming skills of the computer science's master students. She also collaborated in the Smart Photo Booth Workshops (project together with the Scienteens Lab), aiming at sparking high-school students' interest in programming, AI algorithms and their application — and the Luxembourg Science Center (LSC), where users of the LSC interacted with the playful Smart Photo Booth.

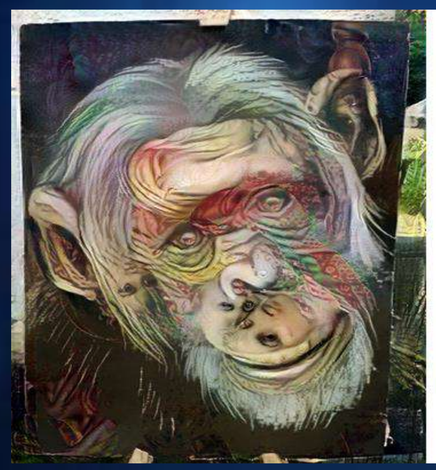
Teaching Body and Program

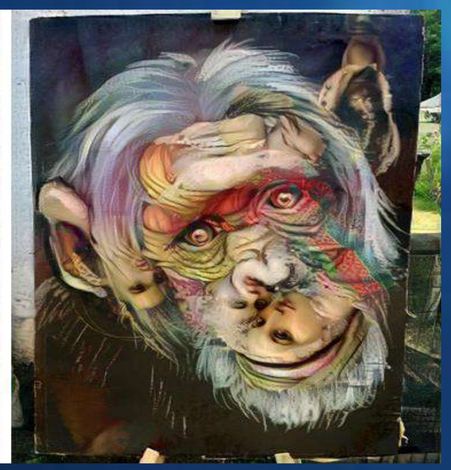
The teaching body includes Researchers, artists and **students from the University of Luxembourg**, who directly contributed to the development of AI & Art projects to provide the most interdisciplinary perspective on AI and Art.
The High school workshop is an interactive program and fun activity designed to introduce students to some of the AI & Art applications. It's particularly interesting for the students from the sciences and art sections as it offers a good opportunity to learn and gain knowledge, in a light way, computational methods, in particular AI and applications, specially related to AI world in Art.
The high school program is the following:

1. **Explain and demystify concepts of Artificial Intelligence and Machine learning in an interactive manner**
   Interactive session to discuss AI Art applications, e.g., visual, musical, and dance arts and to discuss the following questions:
   - What are some AI Art applications you are familiar with?
   - What do you think is the purpose of AI Art?
   - What AI technique do you think is used in each AI Art application?
   - What are the advantages of these technologies and the danger?
2. **Explore and interact with a set of AI & Art projects**
   The projects are:
   - **Automatic Mixed Painting,** allows to breed new artworks by combining the features of two existing painting/images.
   - **Neural Style transfer, Deepfake, AI brings paintings to life,** aim to bring awareness about the development of Deepfake technology, transform a student portrait into a painting in a famous artist style or interact with famous paintings like the Mona Lisa
   - **Video clip creation**, an AI-powered project that use AI to "visualize" the lyrics of a song. A music video is created by using a series of original images generated and interpolated by AI and sequenced along the audio file.
   - **AI avatar dancing**, generate a classical dance sequence based on the "Dying Swan" music piece.
   - .....
3. **Play with Robot and discover the use of Hologram**
   - Make it dance, sing and talk to you
   - Dance with an avatar
   - Chat with QT robot.









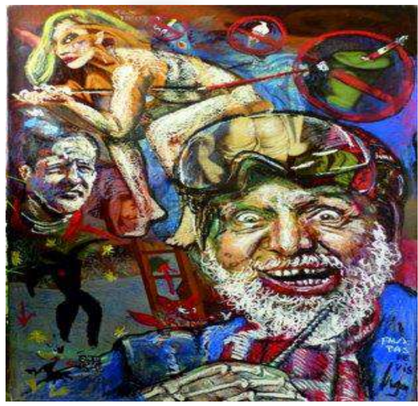
ESCH-SUR-ALZETTE EUROPEAN CAPITAL OF CULTURE

FACULTY OF SCIENCE, TECHNOLOGY AND MEDICINE

HIGH SCHOOL WORKSHOP: ACTIVITY 1

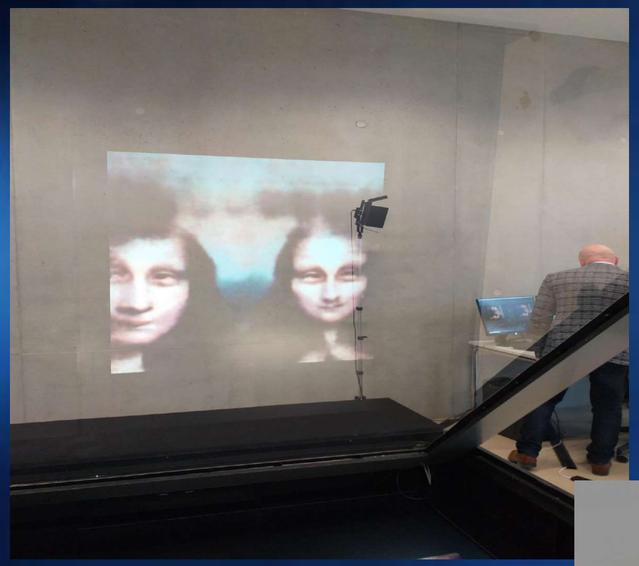
Automatic mixed painting

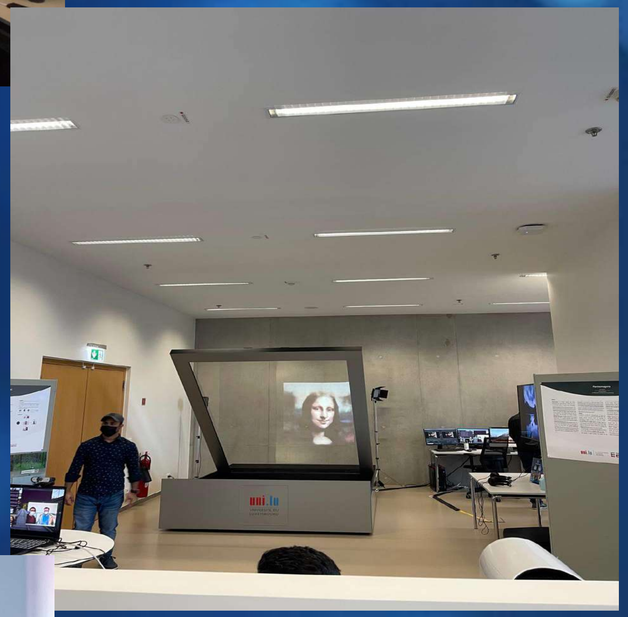
Organizer: Keerthana Murugaraj



Technical process explanation and discussion: How AI imitates and recreates a famous painting with new content that should match the color and texture properties of the base painting to make it look like genuine not the edited one.

Demonstration: Provide students with the list of base painting, list of objects or images to be added to the base. Engage students in looking for those pictures and mix them according to their own interest. Then collect the mixed base paintings from the students and run our model to recreate the mixed painting. The students will be able to view the results of their mixed ideas in the painting.





ESCH-SUR-ALZETTE EUROPEAN CAPITAL OF CULTURE

FACULTY OF SCIENCE, TECHNOLOGY AND MEDICINE

HIGH SCHOOL WORKSHOP: ACTIVITY 2

Interactive Mirror

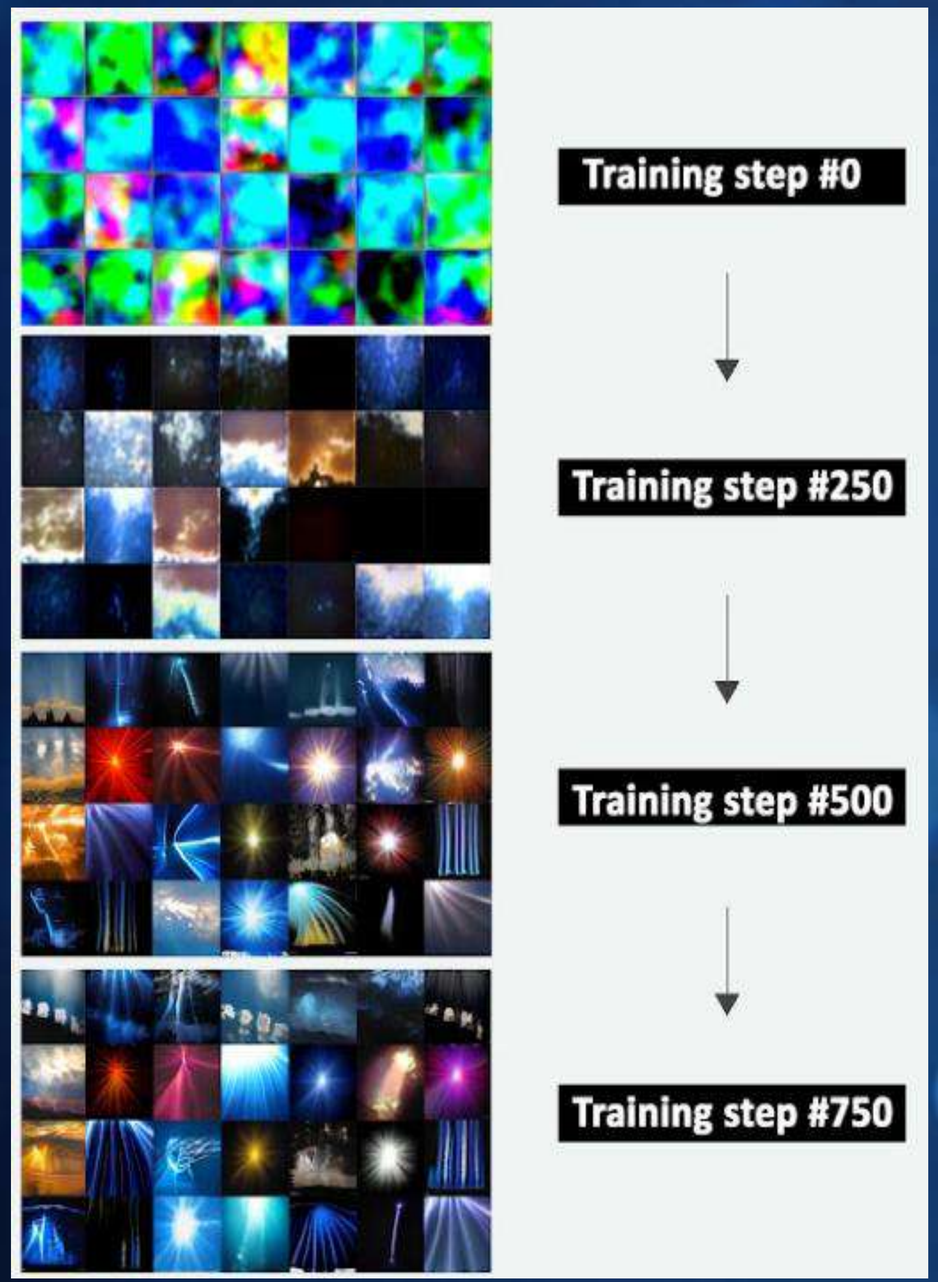
Organizer: Fatima Zahra Fathi

and Gharbin Prince Yaw

Technical process explanation and discussion: How AI creates new images in the style of a given artist by using a deep neural network? How can a trained model take an image of a person and convert it into a Deepfake video in only a few seconds and how a famous paintings like Mona Lisa is mimicking your gesture?

Demonstration: With the help of the Art installation using the hologram, a screen serves as a magical mirror, displaying the student's reflection changed by Artificial Intelligence. A smart photo booth equipped with a QT robot is served to change a person portrait to a painting.

Image collected for the song line « Ray of lIGHT »



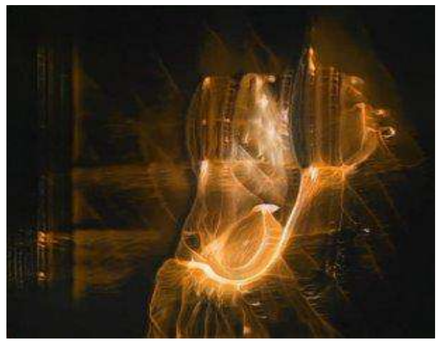
ESCH-SUR-ALZETTE EUROPEAN CAPITAL OF CULTURE

FACULTY OF SCIENCE, TECHNOLOGY AND MEDICINE

HIGH SCHOOL WORKSHOP: ACTIVITY 3

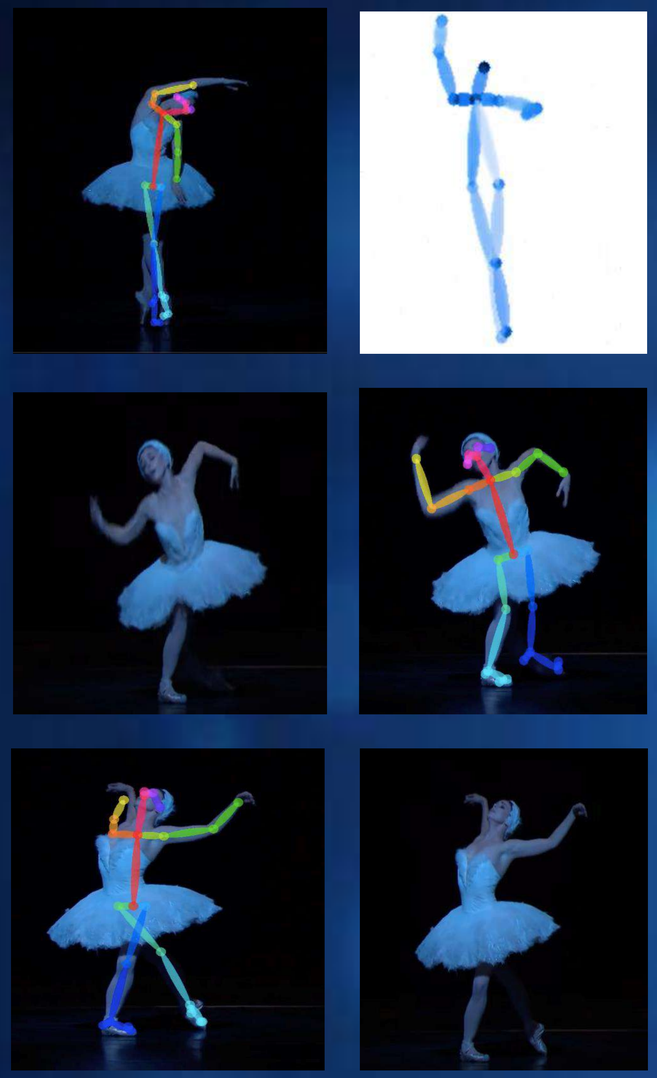
Video clip creation

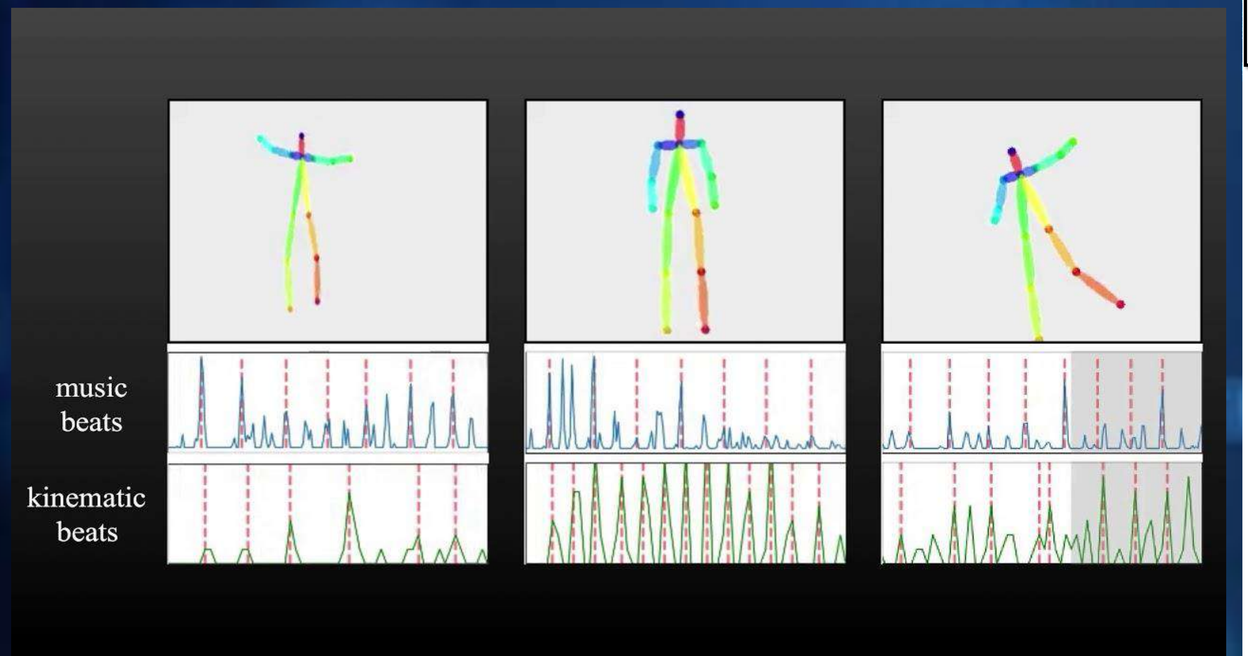
Organizer: Daniel Gareev



Technical process explanation and discussion: how from the "mind's eye" of an AI a cinematic vision of the song's lyrics is created? How a machine learning model trained on thousands of images collected online depicts the conceptual meanings of the song's lyrics? What are the AI models used and what are the other alternatives?

Demonstration: go through the intermediary results of the machine learning process of video clip creation.





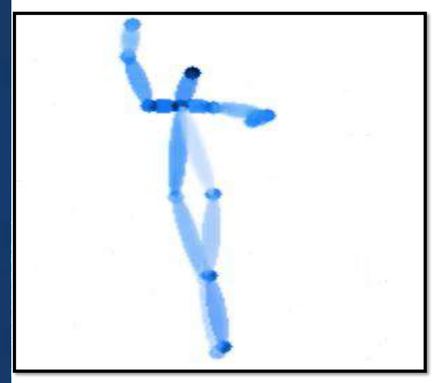
ESCH-SUR-ALZETTE
EUROPEAN CAPITAL
OF CULTURE

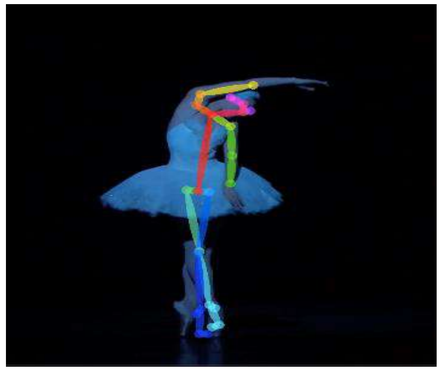
FACULTY OF SCIENCE,
TECHNOLOGY
AND MEDICINE

HIGH SCHOOL WORKSHOP: ACTIVITY 4

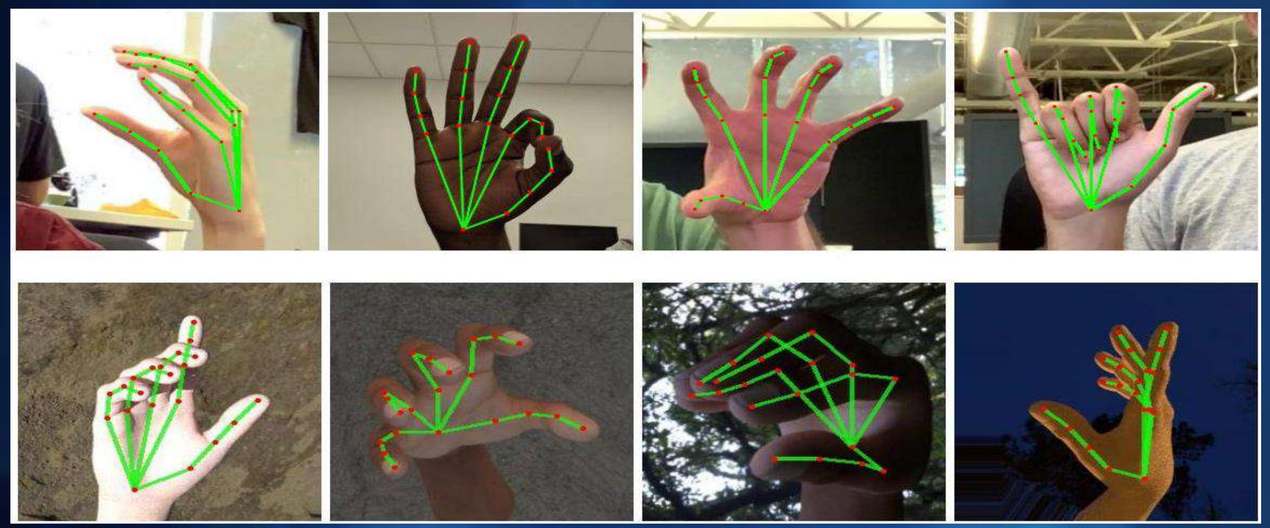
AI Avatar Dancing

Organizer: Nooshin Shojaee





- **Technical process explanation and discussion**: how the generative adversarial network (GAN) is trained to generate dance sequences from an input music?
- **Demonstration and interaction**: go through the video dance generation and analyze the dance generated by AI from a choreographic point of view.



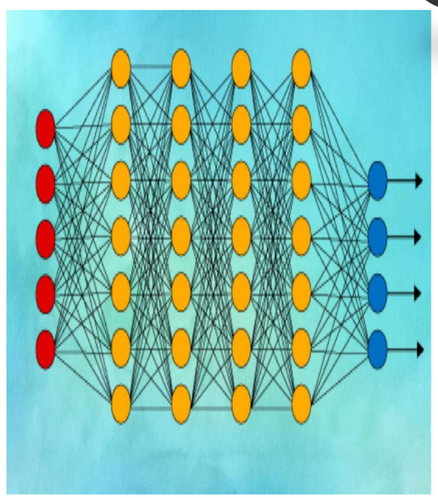
ESCH-SUR-ALZETTE EUROPEAN CAPITAL OF CULTURE

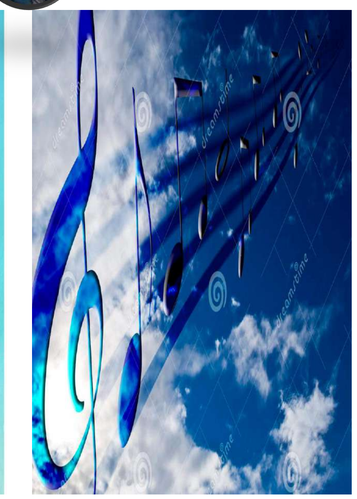
FACULTY OF SCIENCE, TECHNOLOGY AND MEDICINE

HIGH SCHOOL WORKSHOP: ACTIVITY 5

WATCH A FILM WITH YOUR MUSIC

Organizer: Md Shahidul Islam





- **Technical process explanation and discussion**: How does the Machine Learning model detects human emotion and convert these emotions into a piece of music?

- **Demonstration and interaction**: To capture visitor body movement and facial expression and detect corresponding emotions to generate a piece of music concerning user emotions..

ESCH-SUR-ALZETTE EUROPEAN CAPITAL OF CULTURE

FACULTY OF SCIENCE, TECHNOLOGY AND MEDICINE

HIGH SCHOOL WORKSHOP: ACTIVITY 6

Deus X Machina

Organizer: CAO Rui 

BARGHOUTI Yasmine

- **Technical process explanation and discussion**: How GPT3 model, a state-of-the-art generative AI is used to make two chatbots interact to make discussion and conversation about religion topics?

- **Demonstration and interaction**: engage students live with many open questions about ethics, religion, self-perception and possible prejudice and bias. The students will ask their questions and be interactive with a QT robot, who will talk to them about religion.

ESCH-SUR-ALZETTE
EUROPEAN CAPITAL
OF CULTURE

FACULTY OF SCIENCE,
TECHNOLOGY
AND MEDICINE

HIGH SCHOOL WORKSHOP: ACTIVITY 7

Dall E made

an armchair in the shape of an avocado

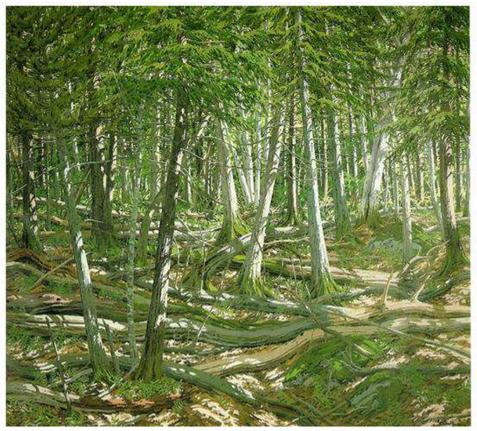
Organizer: Ayoub Oumalek

- **Technical process explanation and discussion**: How Duchampian art made by AI? DALL-Emades experiments with cutting-edge ML models like DALL-E, ruDALL-E and CLIP by Open AI to generate images of mysterious objects resembling 20th century industrial design with relevant art titles.
- **Demonstration and interaction**: engage students live with many open test prompt combination to generate mysterious objects.

Lighthouse by Jamie Wyeth (1993)
Contemporary Realism

The artwork shows a person standing on a cliff looking at a building with a cloudy sky. The artwork gives the impression of being made up of parts, developed in stages and possibly inspired by the style of Edgar Degas. The attempt to accurately and objectively record visual reality in terms of transient effects of light and color in the painting is characterizing the Impressionism art movement. the dominant background and foreground color is White.

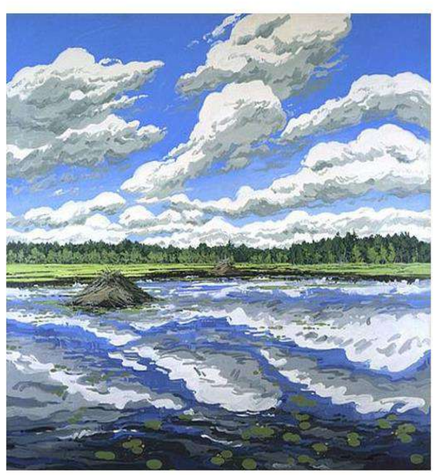
The artwork is minimal and simplistic, with a white background and a figure standing on a cliff looking at a building in the distance. The sky is cloudy and the dominant color is white, which gives the impression of a sterile, cold atmosphere. The figure is the only source of color and life in the image, and its small size makes it seem insignificant in comparison to the vastness of the white background. There is a sense of loneliness and isolation in the image, which may be the artist's intention. However, the overall effect is unengaging and uninteresting.



Old Windfall by Neil Welliver (1982)
Contemporary Realism

I believe this is a forest with trees. The unique perceptions displayed through the painting are similar to those of Vincent van Gogh. The subjective approach to painting shows that the artist is evoking emotion rather than realism in the artwork, which appears to be completed in a Post-Impressionist manner. the dominant background and foreground color is Green.

The artwork is beautifully done and displaying a forest with trees where the dominant background and foreground color is Green. It is a very peaceful and calming image that makes the viewer feel at ease. The use of color is excellent and the artist has done a great job of creating a realistic and inviting scene.



Big Flowage by Neil Welliver (1979)
Contemporary Realism

I believe this is a body of water with ice and trees and a mountain in the background. The outdoor area looks very stress-reducing and aesthetically-pleasing. The expressive use of color and distinctive brushwork is similar to Vincent van Gogh's style. The symbolic and highly personal meanings shown in the artwork display a Post-Impressionist style of painting. the dominant background and foreground colors are consecutively Blue and White.

This is a beautiful and serene scene that really captures the feeling of being in nature. The blue and white colors are very calming and add to the overall atmosphere of the piece. I love the way the ice and trees are depicted and the mountain in the background is a nice touch. The only critique I would have is that the composition is a bit too symmetrical. It would be nice to see more variety in the placement of the elements. Other than that, this is a great artwork!

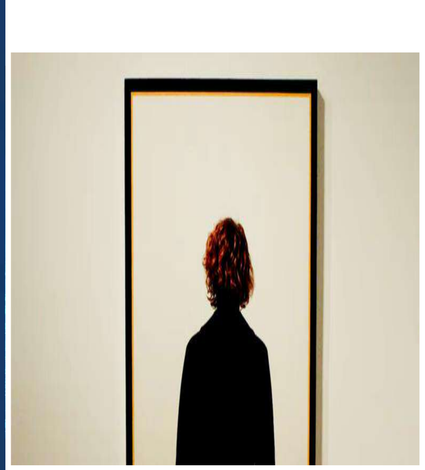
ESCH-SUR-ALZETTE
EUROPEAN CAPITAL
OF CULTURE

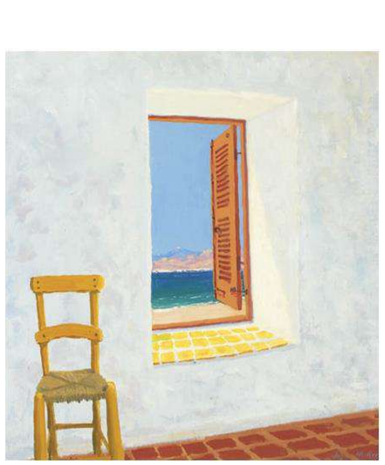
FACULTY OF SCIENCE,
TECHNOLOGY
AND MEDICINE

HIGH SCHOOL WORKSHOP: ACTIVITY 8

AI critic

Organizer: Ayoub Nainia





- **Technical process explanation and discussion**: How AI model write art criticism? Our system aims to automatically generate a text to give a review on a work of art, by receiving an image as input and producing a text, as output, which gives a description and interpretation on the work in question.
- **Demonstration and interaction**: engage students live with many artwork (painting) to generate art criticism and accurate descriptions.

ESCH-SUR-ALZETTE EUROPEAN CAPITAL OF CULTURE

FACULTY OF SCIENCE, TECHNOLOGY AND MEDICINE

HIGH SCHOOL WORKSHOP: ACTIVITY 9

Play with Robot

Organizer: Gharbin Prince Yaw

Fun activities

Play with Pepper Robot

How is Pepper robot programmed to talk and dance?

Make Robot dog move, flip and run

Make conversation with QT robot

Discover the use of Hologram