# Generative AI

## Project Assignment: Creative Support Tools

Semester 1, 2024–25

## Description

Working in groups of up to 3 people, implement a creative support tools (or co-creative system) using approaches explored in this course. In particular, you are expected to explore how multiple systems can be brought together to support human creativity. At least one of the systems used should be a generative system, e.g., a machine learning model. The generative systems that you choose to combine may be trained on task-specific datasets, or may be pre-trained models. By including pre-trained models you can make use of generative systems that would be beyond the time (and resources) available to you.

You may work on this project in **groups of 1, 2, or 3 people**.

The submission **deadline is January 22, 2025 at 23:59**.

## Instructions

Once you have formed a group, you should register your group on Brightspace for *Project Assignment*.

### Background Research

As a group, explore examples of existing systems that have already been developed as Creative Support Tools. A good source of inspiration (for technical projects) is Hugging Face, where projects are hosted and shared.

### Aim and Objectives

As a group, consider the following questions to define the scope of your project *before* you begin implementing your system:

#### What type of problem are you trying to solve?

Types of problems include, but are not limited to, e.g., exploring the outputs of a generative system, exploring the parameters of a generative system, assisting with interacting with a generative system, understanding the generative process (Explainable AI/ML), etc.

#### What type of creative activity are you trying to support?

Types of creativity activity may be defined by the creative domain of the output, e.g. Visual Art, Graphic Design, Music Composition, Poetry Generation. Types of creative activity may also be defined by the stage of the creative process, e.g., Ideation (a.k.a. Brainstorming), Refinement/Exploration, Detailing/Finalisation, etc. Types of creativity activity may also be defined by the context, e.g., integration with an existing system/application (e.g. a plug-in for an existing tool), integration with an existing workflow (e.g. a web service designed to be used in conjunction with other services)

**What type of person are you trying to help?**

Are you trying to support someone familiar with the generative system, e.g., someone who is looking for a technical solution? Or, are you trying to support someone who has no experience with the generative system, e.g., someone who is looking for a simple interface?

**What type of project are you trying to implement?**

**Proof-of-Concept:** Use a small generative system or domain, e.g., a generative system working on a "toy" domain, such as MNIST Fashion, to illustrate an idea for an interesting way to support creativity. This may allow you to produce something very novel, but can only be implemented in a limited way with the time and resources available.

**(Re)Implementation of Existing Example:** Have you seen an implementation of a system that you really like but would like to try to implement in a different way, either to see if you can improve on it (e.g. use a different training dataset for some part of the system) or achieve some slightly different (e.g. combine different systems together).

**Autonomous Installation/Model:** Would you like to build a system of communicating generative systems that run autonomously without explicit user interaction? This type of system might include "ambient" systems for producing generative outputs suitable for installation in a space (e.g. a creative workspace) or a model of interacting creative agents exploring the production of new types of outputs.

**How does your system support creativity?**

What does your system do to support creativity? How are users of your system expected to interact with it? Does your system respond to user inputs, or does your system work pro-actively?

## Deliverables

1. Source code for your system, e.g., Jupyter notebook, including instructions for how to run your system, e.g., runtime requirements, package dependencies, etc., and how to use your system, i.e., user instructions.
   a. You are encouraged to use Python to implement your system, unless there is a clear reason not to, e.g., development of a web service that requires the use of Javascript. If you plan on using a language other than Python or Javascript please contact the teaching staff prior to investing significant time on your implementation to check that it can be accommodated.
   b. You may reference an external implementation, e.g., Colab notebook, GitHub repository, website, but a copy of your source code that can be run locally must be submitted.
2. A report on the implementation of your Creative Support Tool, which should include:
   **a. Project Aims**
      i. What type of problem are you trying to solve?
      ii. What type of creative activity are you trying to support?
      iii. What type of person are you trying to help?

iv. How does your system support creativity?

**b. Background Research**

i. Similar existing systems

ii. Useful resources (e.g. domain-specific datasets, reference implementations of generative systems, potentially useful pre-trained models)

iii. Research literature (e.g. generative systems, creativity research, domain-specific research)

**c. Implementation**

i. What type of project are you trying to implement? For example:

- Proof-of-Concept
- (Re)Implementation of Existing Example
- Autonomous Installation/Model

ii. What resources did you use in your implementation?

- **Note:** You are allowed (and encouraged) to use pre-existing resources to produce your system, but you must acknowledge the source of the resources you have used and provide a description of how you have modified and extended what you have found to implement your system.

iii. What did you implement to build your system?

**d. Example Outputs**

i. Provide some examples of the output of your system. Outputs can be additional files submitted with your report. Outputs should reflect an exploration of your systems capabilities and/or limitations.

**e. Reflection and Future Work**

i. Conclude your report with a reflection on what worked and what didn't. Consider how your implementation satisfies (or doesn't) the aims you set out at the beginning of the process.

- What are the significant achievements of your implementation as a creative support tool?
  - For example, if you re-implemented an existing system, how well does your system compare to the original?
- What are the significant limitations of your implementation as a creative support tool?
- What would you do differently if you were to start your project again now?

ii. Identify some future directions for your project, should you or someone else want to continue it.

- How might your creative support tool be extended?
  - For example, if you implemented a proof-of-concept, what domain/dataset would you like to see your system be extended to support?
- How might your creative support tool be improved?