Master thesis proposal

Title:

*Identifying artistic styles from verbal descriptions of visual arts using large language models*

1. Background

Image search is now a common feature in popular search engines. **Visual artists** are interested in a type of search that’s not just about finding a specific image or something similar, but **any image that matches a particular artistic style**. The person searching may not have any example images, but they can provide **a detailed description of the artistic style** they're looking for. This description, called ekphrasis, is a verbal depiction of a visual artwork and uses specific terms, enabling artists to communicate elements of graphic style in a way that's clear to one another.

Currently available search engines for artworks, such as Dribbble (<https://dribbble.com/>), mainly rely on keywords related to style or content, and they are not capable of processing ekphrasis.

Visual artists are looking for **a search system that relies solely on verbal descriptions of artworks**. Images uploaded to the system would be accompanied by ekphrases provided by their authors, and users could enter a prompt in the form of ekphrasis, allowing the search engine to make precise matches based on the subtle details in the ekphrases.

It remains an open question whether current language models are capable of **extracting the meaning from ekphrasis** that's necessary to make a correct match.

1. Objectives

This thesis aims to explore the potential of current natural language processing tools in recognizing the style described in ekphrasis. The final result of this work should be a program that assigns an artistic style to the given ekphrasis.

To make the task manageable, the following limitations are introduced.

* **Only six categories of artistic styles** are introduced, grouped into opposing pairs, namely: Minimalist - Complex, Vintage - Modern, Geometric – Organic.
* The available dataset will contain **ekphrases of limited length** to facilitate tokenization and the creation of embeddings.
* The ekphrases created by the artists **will vary in difficulty**. The simplest ones, which are easiest to recognize, will include **clues in the form of specific keywords**. The more difficult ones will refer to the style in a somewhat obvious way, only the most challenging will suggest the style in a more subtle way.
* A fully functional application isn't required, only a test environment for studying the algorithm.
* The algorithm can be based on widely available language models, with task-specific adjustments made using transfer learning.

The student's main task is **to propose a classifier and implement it** in a way that facilitates evaluating its performance using different model parameters and hyperparameters related to the learning or regularization process.

The proposed algorithm should also undergo **critical evaluation** using real data and **recommendations for future development** outlined.

1. Data

The dataset will consist of labeled ekphrase examples, provided by the staff at The Eugeniusz Geppert Academy of Art and Design in Wrocław, under the supervision of Professor Łukasz Huculak, a painter. New ekphrases can be requested as needed throughout the project

1. Required background

Good programming skills.

Solid knowledge of key concepts of Natural Language Processing or Large Language Models.

1. Contact person

Jarosław Drapała

Faculty of Information and Communication Technology

Wrocław University of Science and Technology

e-mail: jaroslaw.drapala@pwr.edu.pl