HUNGARIAN UNIVERSITY OF FINE ARTS
DOCTORAL SCHOOL

Painting Beyond and Below the Horizon of (Big) Data Cloud

"those included in this classification"

Theses of DLA dissertation

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The topic and theses of the dissertation

My doctoral dissertation deals with the nature of visual and conceptual similarities between images, which I investigated with the help of virtual databases containing reproductions of artworks, and also presented results based on my own experience. For an analysis, if we examine reproductions as well, we open the field for certain measurement and categorizing operations. It is true that in reproductions some properties of the artworks are not observable (e.g. real size, spatiality) and some appear more dominant, so in many respects the artworks look different from what they really are. This would lead us to expect that the various operations made by using reproductions could only mislead us when looking at similar properties of the images, but in most cases this is not like that. Reproductions create a particular synchronicity between artworks, allowing us to see certain works together that we might not otherwise be able to physically see side by side, and to find common features that we might not notice in the original works. This is a particularly useful experience in case of virtual image databases which store pixel-based images (images with the same 'component') and use machine learning algorithms to sort them. The encoding system of the algorithms, which perform complex mathematical operations, brings images (that are difficult to compare in reality) into a common denominator and thus make them comparable.

Image recognition algorithms convert the pixels (so the properties) of digital images into vectors. When they make comparative analyses, they essentially deal with vector patterns, so they are counting. The algorithms ignore some properties of the images, they do not think or interpret; nevertheless, they use their own abstract operations to create relationships and definitions that can cast some images in a new light. If such algorithms analyse and categorize reproductions according to certain criteria, they can create sets that an editor with human logic would never do. These sets can point to the limitations of not only the machine but also the human categorization, the frequent unanimity of our thoughts, and can introduce new interpretative aspects.

The Google Arts & Culture website, which virtually combines museum collections, has art education programs under the Experiments menu that let you experience what it's like when a machine learning algorithm groups and selects reproductions, or create a fictitious path between two works of art through other works. The surprising reactions of these image analysis programs can help us to ask ourselves again questions that concern the basic functioning of images. In connection with the analysis of some of these programs, I have examined artistic issues that are important to me and that I also deal with in my work. In this experiment, I realised that not necessarily the juxtaposition of obviously similar images is the most interesting. Rather, it is the combined examination of images or phenomena that are quite different from each other, but which are nevertheless connected on an intellectual level, and can lead to enlightening discoveries.

However, the computational methods of a machine algorithm can only be inspiring to an artist as long as its answers are different from human answers. Since engineers almost always calibrate algorithms to give as 'human-like' responses as possible, this inspirational quality can be completely lost when they reach the 'human-like' stage. 'Smart', predictable algorithms are the least interesting and useful from an artist's point of view.

We treat algorithms appropriately when we look at them as tools that we can use, even for artistic purposes. For example, how can I use the algorithms' answers and the Experiments programs to better understand what I am doing (as an artist)? I often try to understand the characteristics of images by variation of context, detail extraction, transformation, so it often happens that I break down an image into its basic elements, or focus on one feature only, and then examine the connections based on that. Usually I create several similar images, not just a

single image, so that these variations can be used to create groups or systems. I examine problems concerning painting, so I looked at the Experiments programs from this point of view. I have juxtaposed my own experiments in image analysis with those of the artificial intelligence, and in doing so I have come to see phenomena and artistic issues in a different light, and to see different ways for further development of my work. It is also the characteristic of a painter, not only of an image recognition algorithm, to reduce and abstract the forms used as a starting point and translate them into his/her own 'language', and thus to see the world as a peculiar fabric of abstract forms.

By starting from a completely different direction and following different logics, you can arrive at similar-looking results in the creation process – just as a machine algorithm can arrive at the same result as a human, based on a completely different calculation. Thus, if two works are similar, it does not mean that they were made by the same method and are about the same thing; but if they are visually similar, we are inadvertently inclined to speculate about other, hidden connections.

Transforming, abstracting and breaking down images into pattern structures can be not only an arbitrary game, but also an analytical method that helps to understand the images. This is because it is not so easy to completely erase the characteristics of an image (through transformations); no matter how much we reduce, change, extract its characteristics, certain properties will still be retained and retrievable. We often find that the character of an image is significantly affected by even a small change, the colour or size is not irrelevant. As viewers and creators, we do not express an opinion that the differences between similar images have no significance. However, in some computational and classification procedures, it is not possible to take all the details into account, and in fact, it is typically possible to arrive at a new result by ignoring certain details.

Structure of the dissertation

The dissertation consists of 7 chapters. In Chapter 1, I briefly introduce the Google Arts & Culture image database used as an example, and from Chapter 2 onwards the names of the image analysis programs provide the opening words of each chapter. The programs raise the topics of the chapters, and the problem area determines what I presented of my works. I have mainly examined problems relevant to painting.

Chapter 1: *Arts & Culture* image database

Chapter 2: *Beyond Scrolls & Screens* – details of images together

Chapter 3: *Curator Table* – patterns of an image database

Chapter 4: *Tags* – image recognition with machines

Chapter 5: *X Degrees of Separation* – path between two images

Chapter 6: *Art Transfer* – artificially intelligent images

Chapter 7: *Art Palette* – only similar in colour