Sarah Mautsch, Tim J. Peters

Experience How a Specific Artist Sketches with the Help of Machine Learning

A tool for creators to build on top of other ideas based on a recurrent neural network that uses digital collections as training data.

Research Question

How might we help people to relive patterns of the past in order to spark their curiosity for digital collections?

We see an opportunity to arouse people's curiosity with the help of (recurrent) neural networks, trained with data of a digital collection. These networks can make predictions based on their training data and therefore create an artefact that connects people subtle to the past, while apparently only showing them what the collection means for them in this sudden moment.

By using one of the simplest content-types, such as sketches, bias towards action is encouraged.

Concept

One of our main inspirations is a project by Andy Matuschak. In his project he extends a sketching environment with real time graphical predictions. Therefore he uses own drawings of the past in combination with a machine learning algorithm to make suggestions on how to continue the line he is currently drawing. The interesting thing about this is, how it feels to draw with this tool. Andy describes it as it feels like the pen 'wants' to go into a specific direction or it wants to draw a specific thing.
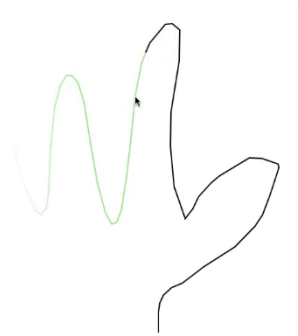
We'd like to use this approach to enable users to experience how artists felt when they drew. Based on an archive of sketches (e.g. the work of Paul Klee in the Harvard Art Museum's collection) a

machine learning algorithm could be trained on how a specific artist draws. Interested users then get suggestions how the artist would probably have continued their work while drawing.

This suggestions mechanism isn't necessarily limited to simple sketches or shapes. Even suggesting colors or elements a specific artist would have used is conceivable. Making deductions from the patterns an artist uses or the characteristics of a certain trend (e.g. Swiss Style) can be viewed as other variations of this idea and some might be worth exploring deeper.

Enabling Technologies / Field Overview

Fortunately much of the development in the fields of machine learning and arts is documented quite well to the point where code is being released on github etc. This helps us not having to start from the scratch.

Here are just a few examples:

— The Unreasonable Effectiveness of Recurrent Neural Networks (Article)
— Tensorflow (Open-Source Machine Learning Framework)
— Draw Togther with a Neural Network (Article and Example Code)
— A Neural Representation of Sketch Drawings (Paper)
— Writing with the Machine (Article/Instructions)

Difficulties / Next Steps

Technology

Still technology will be one of the biggest challenges for us in this project (apart from the design process itself of course). Beside small gimmicks and tests our experience in the fields of machine learning is quite limited yet. In this project we'll have to get a deep learning algorithm running and additionally implement some kind of editor or build an implementation into an existing one.

Training Data

Machine Learning usually relies on a huge amount of data. Especially if we need to limit the training artworks to sketches only there will not be too much material available in our sources.
This is not necessarily a show stopper. Much more it can be seen as a design challenge. This could e.g. lead to a case where our prototype is not directly working with an archive but with the drawings of other people trying to imitate the artist etc.

Personae

The user group of our concept can be separated into different groups:

— **People who want to get inspired by other artists for their own work.**
Especially people who are comfortable ideating with a hands on approach. This could include everyone from aspiring artists to designers.

— **People who want gain a better understanding of the work of an artist.**
This can be people using the tool in addition to a museum visit or other arty people who want to feel into an artists working process.

— **People who want to do justice to the work of an artist.**
This could be artists or curators who want to use the tool itself as a holistic and more authentic representation of the artist's work.
Additionally in this case the tool could serve as a hybrid between showing users suggestions of artists sketches and collecting at the same time data for a new archive ('people who tried to sketch like artist XYZ') therefore it would also foster citizen science.

Timeline

Week I
First Sprint

Week IX
Final Presentation at MIT

Ideation

Research

Concept Development

Prototyping / Development

User Testing

Finalisation / Presentation