Deep inbetweening

Masters Thesis Proposal

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DEEP INBETWEENING

Objectives

Inbetweening is the process of creating intermediate drawings between keyframes in the traditional 2D animation pipeline. It is a difficult problem in general, which has received only limited solutions in restricted cases [1]. Recently, deep learning methods have been proposed for interpolating [2] or predicting [3] video frames in movies, and they have been adapted to the case of generating drawings in the anime style [4]. One drawback of those methods is that they cannot easily be controlled by artists.

Goals

In this internship, we would like to analyze the capabilities of such networks on the task of inbetweening short animation cycles of synthetic line drawings. The task will be to predict intermediate frames from selected keyframes, and to propose novel network architectures allowing artists to control the inbetweening process by redrawing intermediate frames interactively.

Solution

For this study, we will create a new dataset of synthetic image sequences obtained with line renderings of rigged and skinned 3D meshes, using the open source software package syndraw (https://gitlab.inria.fr/D3/contour-detect) as described by [5]. We will then propose new self-supervised deep learning methods for predicting intermediate frames from key frames in those sequences. Most importantly, we will compare different encodings (vector graphics, raster images) and high-level representations (semantic parts, topology) of the sequences suitable for this complex task [6,7]. We will perform a comparative subjective evaluation of the results and propose research directions for future work.

References

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