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Generative Artificial Intelligence for Rotoscoping

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ABSTRACT

Rotoscoping is a commonly used animation technique that involves taking live action filmed material and sketching on top of it to produce an animation. Rotoscoping is expensive and time consuming, but can produce smooth, eye-catching, and realistic animation. This disclosure describes rotoscoping techniques based on generative AI. Frames of a live action source video are obtained. Each frame is passed through generative AI with hyperparameters tuned for rotoscoping. A text prompt (or other suitable prompt) that specifies the type of output is provided to the generative AI. Frames generated by generative AI are re-assembled into a rotoscoped video. The techniques reduce the cost of producing animation while improving its quality and appeal.

KEYWORDS

- Rotoscoping
- Artificial intelligence (AI)
- Image generation
- Generative artificial intelligence
- Generative model
- Animation
- Image synthesis
- Image transformation

BACKGROUND

Rotoscoping is a commonly used animation technique that involves taking live action filmed material and sketching on top of it to produce an animation. Rotoscoping is expensive and time consuming, but can produce smooth, eye-catching, and realistic animation. An example of rotoscoping appears in [1].

Generative artificial intelligence (AI) provides an image-to-image construct where the generated image can be guided from a source image. For example, generative AI can turn a pencil sketch into a highly detailed image, reproduce a photograph in the style of an oil painting by a well-known artist, turn a photograph into a cartoon, etc.

DESCRIPTION

This disclosure describes rotoscoping techniques based on generative AI. Frames of a live action source video are obtained. Each frame is passed through generative AI with hyperparameters tuned for rotoscoping. A text prompt (or other suitable prompt) that specifies the type of output is provided to the generative AI. Frames generated by generative AI are re-assembled into a rotoscoped video.

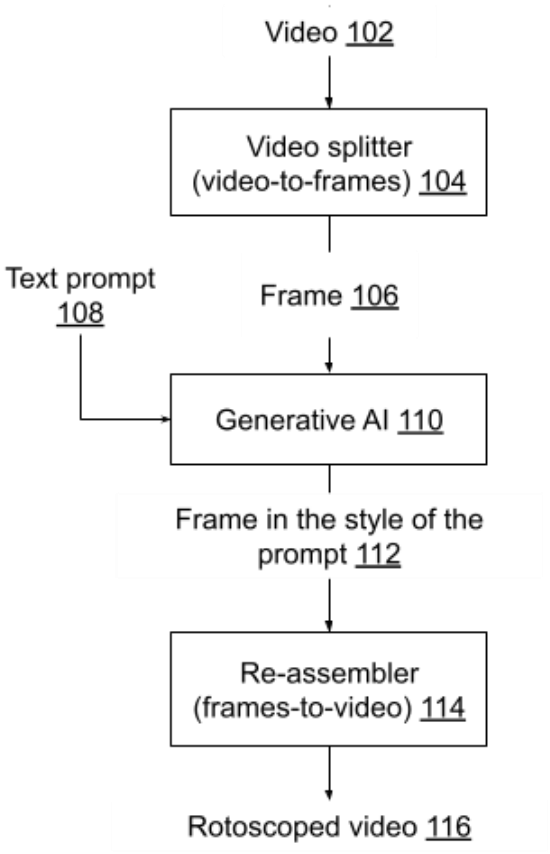

Fig. 1: Using generative artificial intelligence for rotoscoping

Fig. 1 illustrates a process to use generative artificial intelligence for rotoscoping. A live action video (102) is fed into a video splitter (104), which splits the video into frames (106). A text prompt (108) that describes the desired style of the output is provided by a user. Some example text prompts are ‘pencil-drawn comic-book adventure,’ ‘charcoal art,’ ‘oil painting in the style of van Gogh,’ ‘pixel art,’ ‘cubist,’ ‘Egyptian hieroglyphics,’ etc. A generative AI model (110) accepts the frame as input and generates an output frame in the style specified by the prompt (112). A re-assembler (114) re-assembles the frames produced by the generative AI module into a rotoscoped video (116).

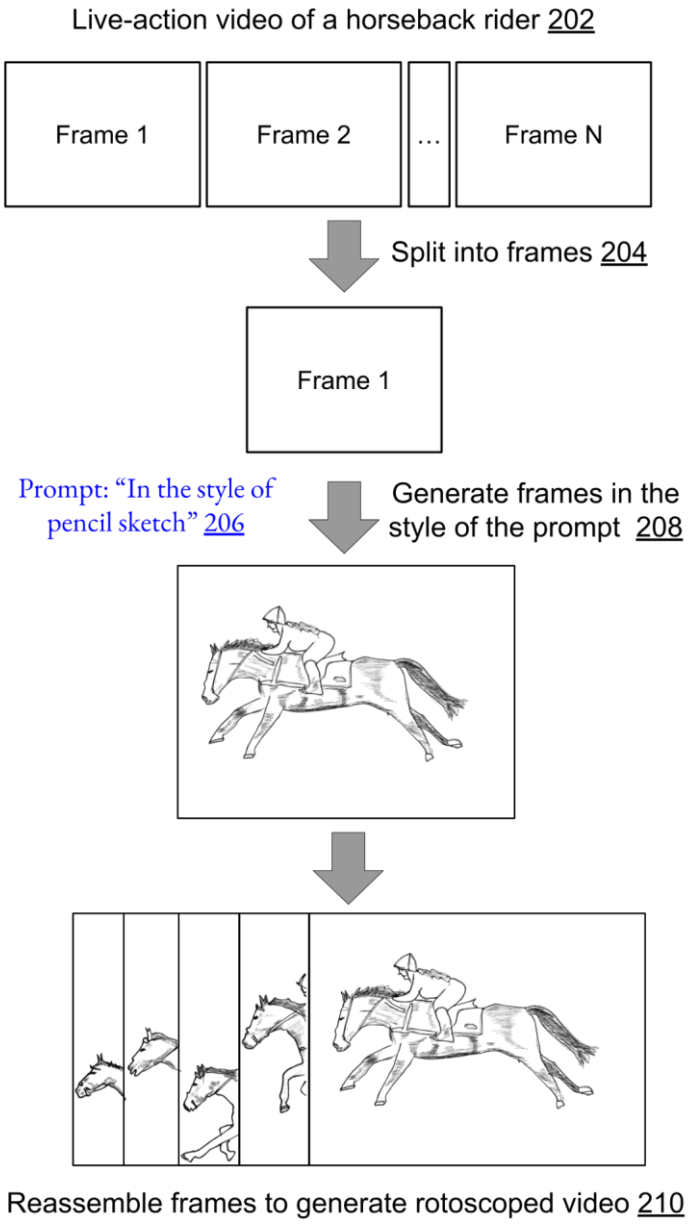

Fig. 2: An example of using generative AI for rotoscoping

Fig. 2 illustrates an example of the use of generative AI for rotoscoping. A live action video (202) is split into frames (204). On the basis of a user prompt ("in the style of a pencil sketch," 206), the generative AI generates a frame based on the input frame in the style specified in the prompt (208). The sequence of AI-generated frames is reassembled to generate rotoscoped video (210).

The described techniques are applicable generally to the production of animation, to the introduction of animated characters into live action video (or vice-versa), etc. For example, a video hosting/sharing service can offer a generative AI rotoscoping as described herein. As another example, generative AI rotoscoping can be built into a camera, such that a user can produce animated videos in near real time. The use of generative AI techniques reduces the cost of producing animation while improving its quality and appeal.

CONCLUSION

This disclosure describes rotoscoping techniques based on generative AI. Frames of a live action source video are obtained. Each frame is passed through generative AI with hyperparameters tuned for rotoscoping. A text prompt (or other suitable prompt) that specifies the type of output is provided to the generative AI. Frames generated by generative AI are re-assembled into a rotoscoped video. The techniques reduce the cost of producing animation while improving its quality and appeal.

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