Framer: Interactive Frame Interpolation

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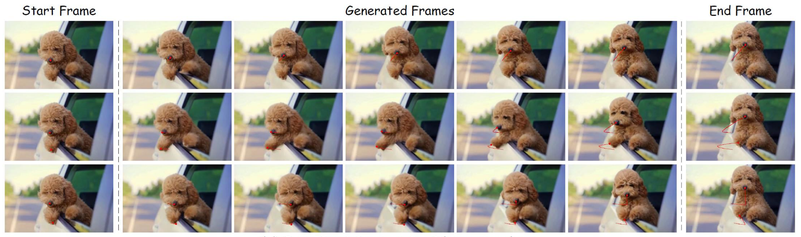
Introduction

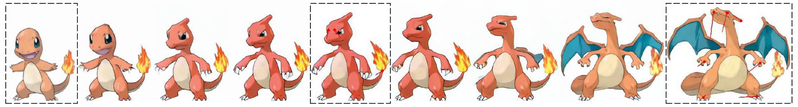
➢ **Motivations**
- Interactivity for Frame Interpolation
- Explicit Correspondence Modeling
- Feature-space Point Tracking

➢ Framer is an interactive frame interpolation method that allows users to produce smoothly transitioning frames between two images by customizing the trajectory of selected keypoints, enhancing control and handling challenging cases.

➢ Framer shows strong capabilities on a broad range of tasks, including interactive frame interpoaltion, cartoon and sketch interpolation, image morphing, and more.



(a) Same input image pair with varying drags


(b) Image morphing (inputs highlighted by dashed boxes)

Code: https://github.com/aim-uofa/Framer
Demo: https://huggingface.co/spaces/wwen1997/Framer
Paper: https://arxiv.org/abs/2410.18978
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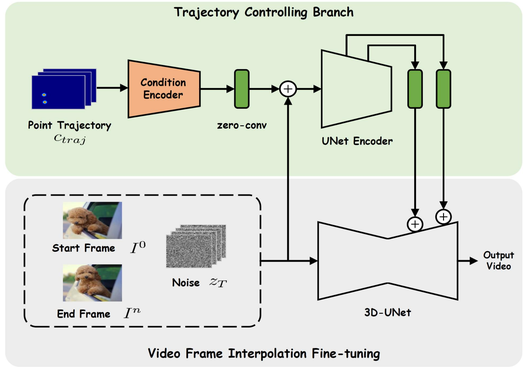
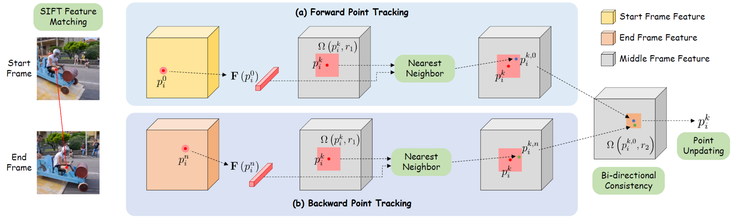
Method

➢ **Trajectory Control for Interactive Frame Interpolation**
- Training
  - Firstly, we train the UNet for frame interpolation
  - Then, we train the trajectory-conditioning branch
- Sampling
  - Interactive frame interpolation via drag-control
  - "Autopilot" mode with correspondence enhancement



➢ **"Autopilot" Mode via Trajectory Estimation**
- Explicit correspondencing modeling helps frame interpolation
- SIFT point matchining for trajectory initialization
- Bi-directional point feature matching for trajectory updating



Experiments

➢ **Comparisons with previous methods**

➢ **Diverse Applications**
- Cartoon & Sketch Interpolation
- Novel-view Synthesis, Slow-motion Video Generation
- Image Morphing, Time-lapsing Video Generation
- ….