Geometry Driven Progressive Warping for One-Shot Face Animation

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Introduction

- Displacement field estimation is important for face motion transfer
- How to generate accurate displacement field?
- Our proposed method
  - Geometric displacement field and posed neural codes as guidance
  - Progressive warping module (PWM)

Geometric Guidance

- Geometric displacement field
  - Compute the displacements between source and driving face meshes
  - Render the displacements using the driving mesh topology
- Posed neural codes
  - Attach a learnable embedding to template mesh
  - Render the embedded template using the source and driving mesh topologies

Progressive Warping Module (PWM)

- Designed for better feature (re-)alignment
- Alternates between feature (re-)alignment (warping) and displacement estimation

Architecture Overview

Experiments

Face Editing

Face Reenactment: Same Id & Cross Id

geom. disp. | neural codes | driving neural codes
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src. geom. disp. | edit by shape, pose & expression | drv. geom. disp. | codes
src. geom. disp. | codes | drv. geom. disp. | codes