Egocentric Videoconferencing - Supplemental Document

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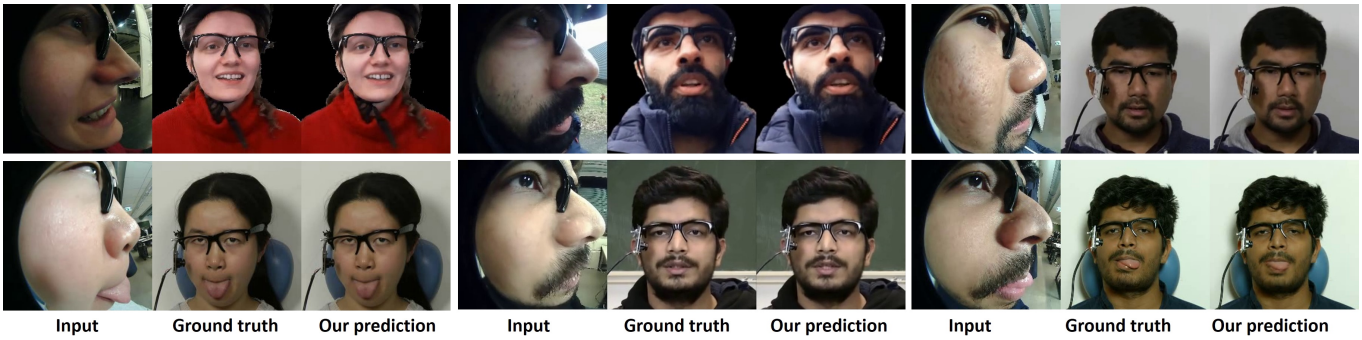

Fig. 1. We present an approach for hands-free videoconferencing. Given the view of an egocentric camera, that is attached to a eye-glasses frame, we predict a frontalised video stream which is common in videoconferencing.

We introduce a method for egocentric videoconferencing that enables hands-free video calls, for instance by people wearing smart glasses or other mixed-reality devices. Videoconferencing portrays valuable non-verbal communication and face expression cues, but usually requires a front-facing camera. Using a frontal camera in a hands-free setting when a person is on the move is impractical. Even holding a mobile phone camera in the front of the face while sitting for a long duration is not convenient. To overcome these issues, we propose a low-cost wearable egocentric camera setup that can be integrated into smart glasses. Our goal is to mimic a classical video call, and therefore, we transform the egocentric perspective of this camera into a front facing video. To this end, we employ a conditional generative adversarial neural network that learns a transition from the highly distorted egocentric views to frontal views common in videoconferencing. Our approach learns to transfer expression details directly from the egocentric view without using a complex intermediate parametric expressions model, as it is used by related face reenactment methods. We successfully handle subtle expressions, not easily captured by parametric blendshape-based solutions, e.g., tongue movement, eye movements, eye blinking, strong expressions and depth varying movements. To get control over the rigid head movements in the target view, we condition the generator on synthetic renderings of a moving neutral face. This allows us to synthesis results at different head poses. Our technique produces temporally smooth video-realistic renderings in real-time using a video-to-video translation network in conjunction with a temporal discriminator. We demonstrate the improved capabilities of our technique by comparing against related state-of-the art approaches.

CCS Concepts: • **Computing methodologies** → **Computer graphics**; *Image manipulation*; *Animation*; *Rendering*.

Additional Key Words and Phrases: Videconferencing, Egocentric, Face Frontalisation, Neural Rendering, Reenactment, Face.

ACM Reference Format:
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A APPENDIX

Tab. 1–2 lists the sequences used in our experiments. For each sequence, we indicate the total number of frames. We use 7,500 frames for training our technique, 2,500 frames for validation and the rest for testing.