

# MEGANE: Morphable Eyeglass and Avatar Network

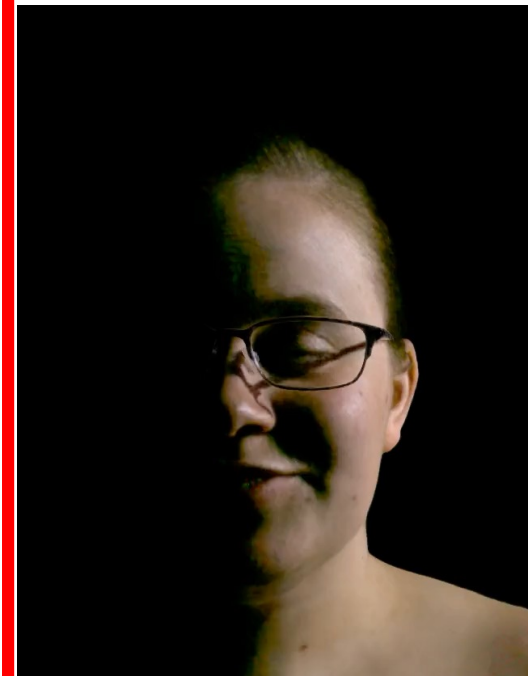
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<sup>1</sup>Australian National University, <sup>2</sup>Meta Reality Labs Research

Morphable/Compositional



Relightable



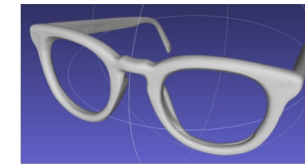
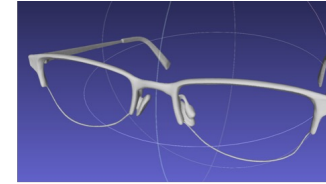
Lens Insertion



# Challenges

## Eyeglasses Modeling

- Varying topology
- Diverse materials (e.g., metal, translucent plastic)



## Interaction Modeling

- Non-local light transport (e.g., shadows)
- Shape deformation by head/glasses
- Motion by facial expressions



# Results of Our Model



# Comparison with VideoEditGAN [Xu et al.]

Input



VideoEditGAN



Ours



**Comparison:  
GeLaTO**  
[Martin-Brualla et al.]

GT

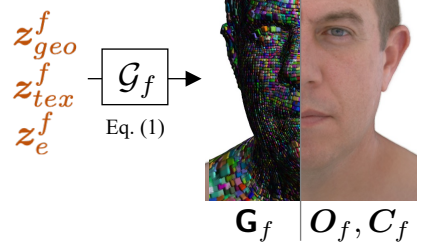
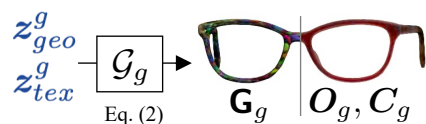


GeLaTO

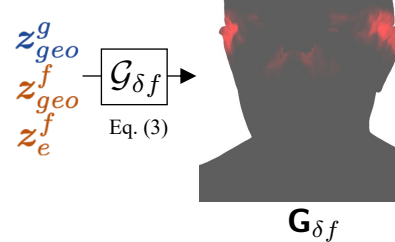
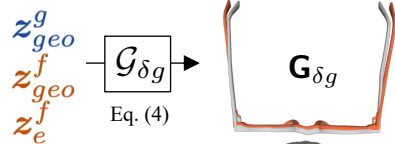


# Overview

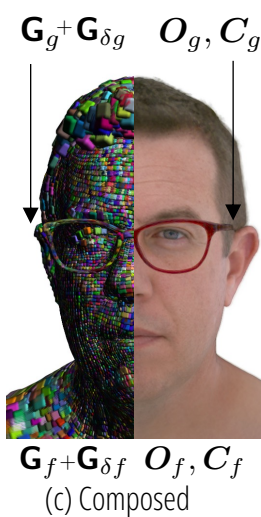
## Morphable Geometry



(a) Isolated

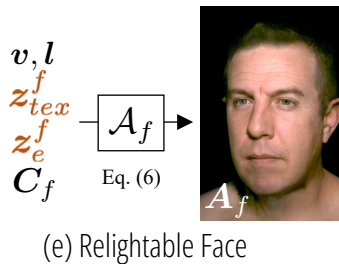


(b) Interactions

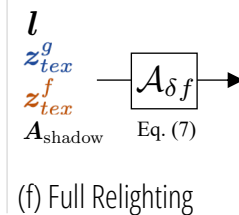
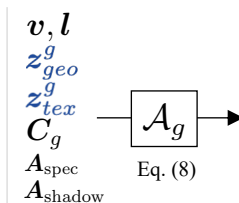


(c) Composed

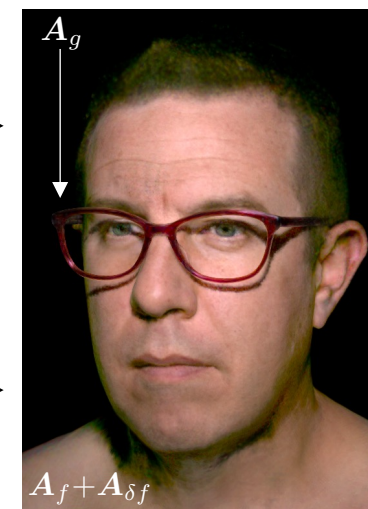
## Relightable Appearance



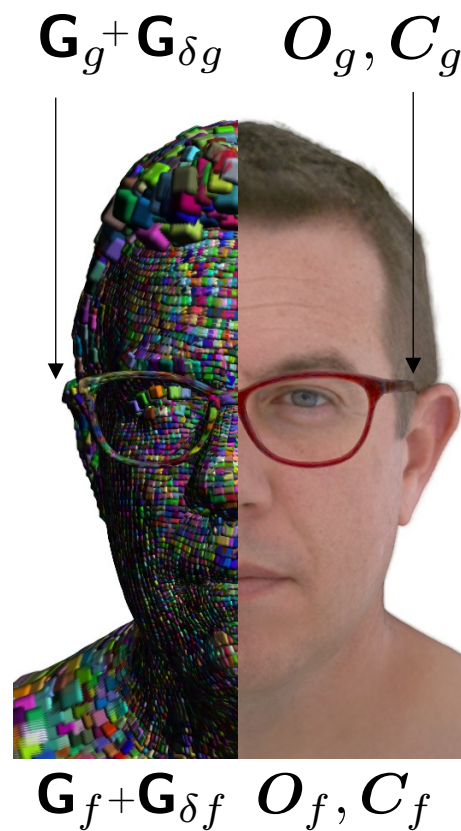
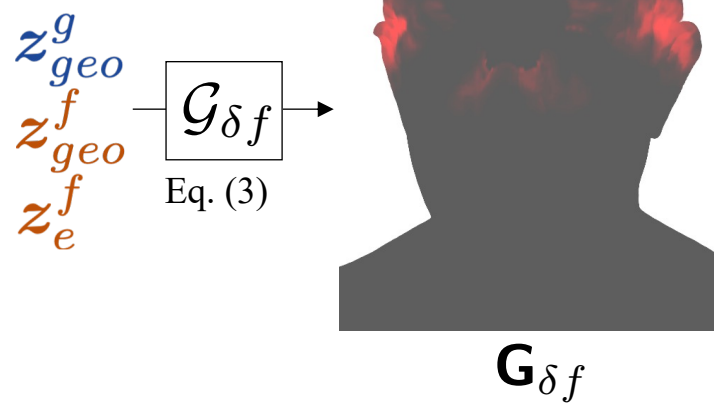
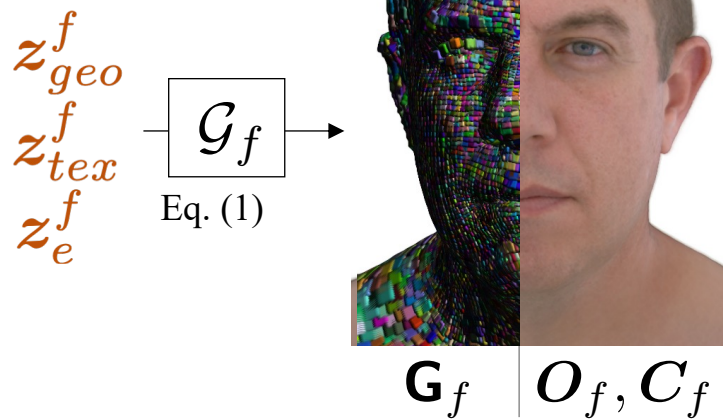
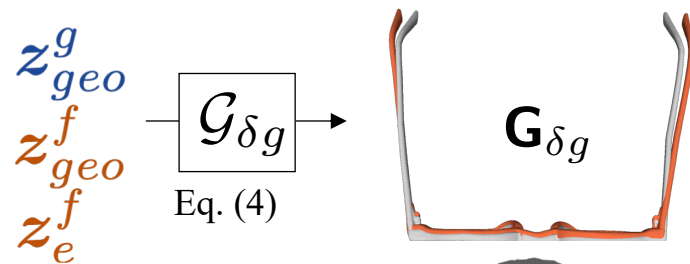
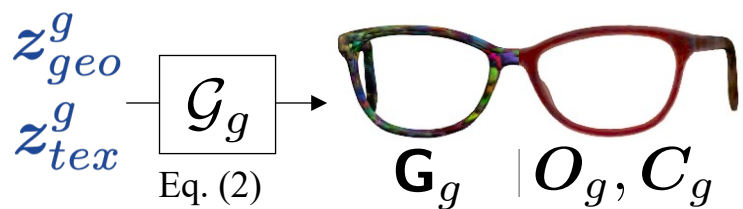
(e) Relightable Face



(f) Full Relighting



# Morphable Geometry



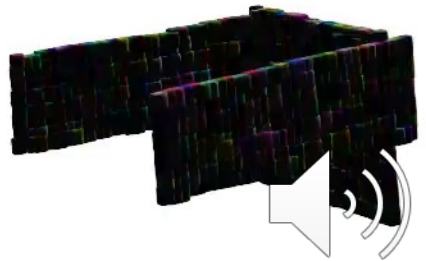
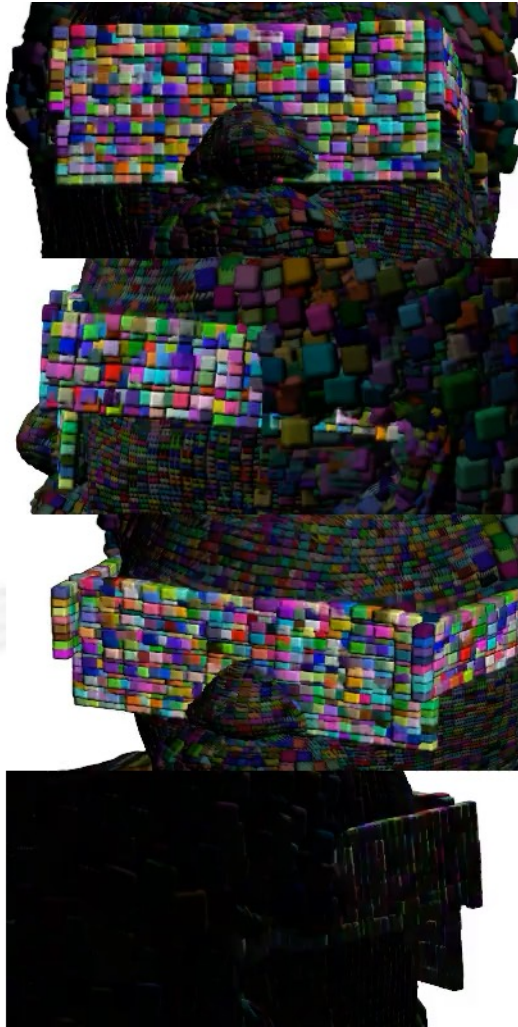
(a) Isolated

(b) Interactions

(c) Composed



# Training Morphable Geometry





# Trained Morphable Geometry



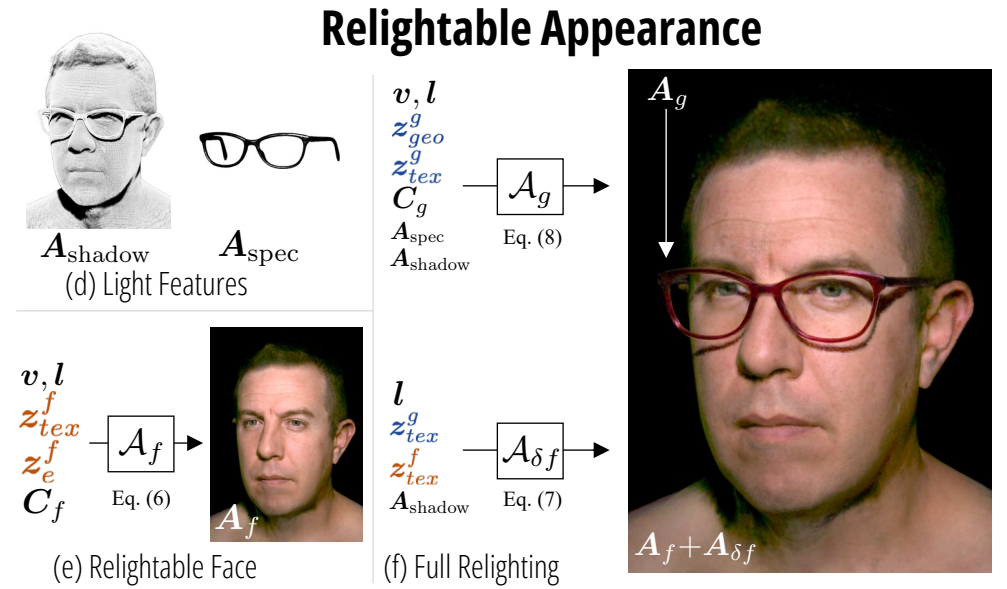
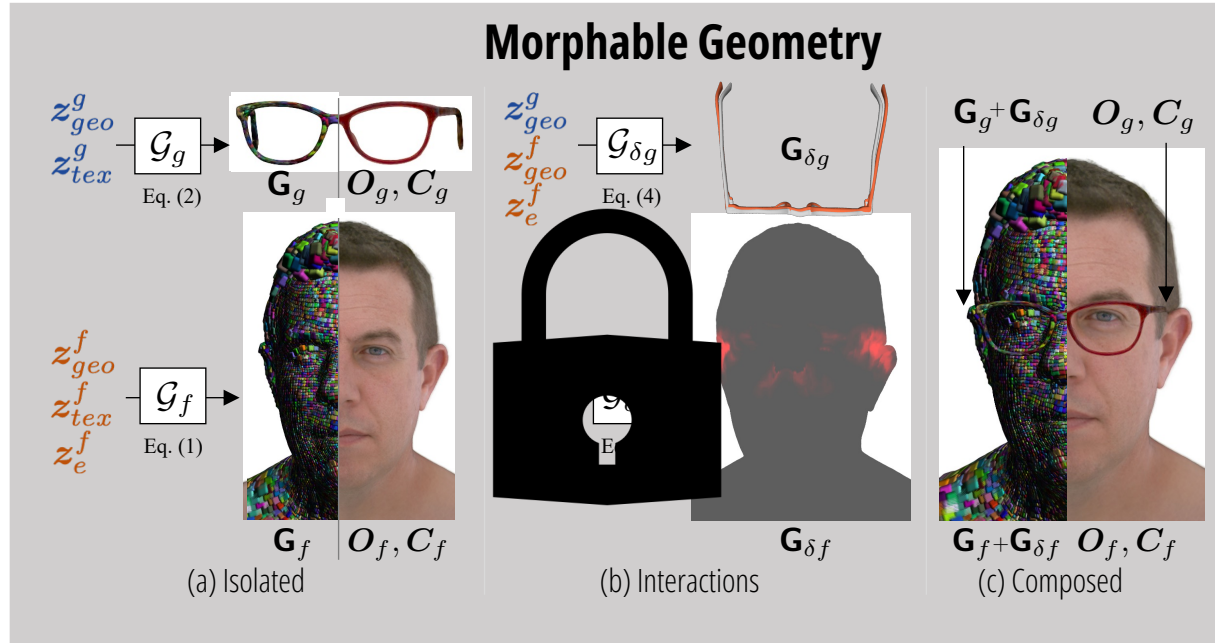
# Geometric Interaction (face deformation)



# Geometric Interaction (glasses deformation)



# Overview

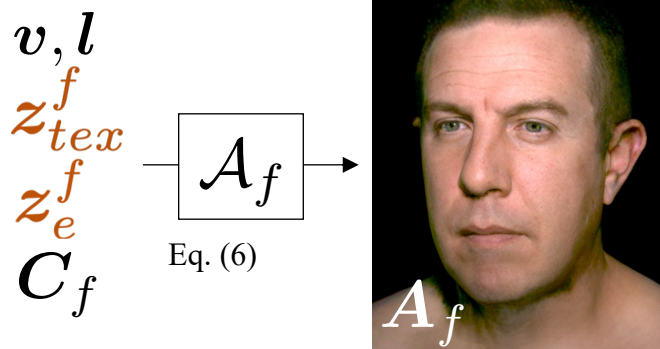


# Relightable Appearance

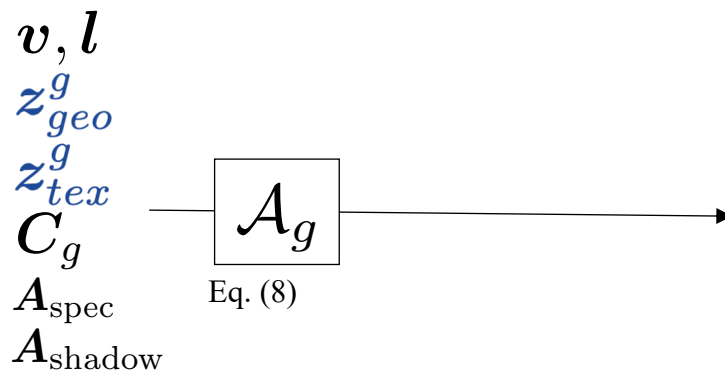


$A_{\text{shadow}}$        $A_{\text{spec}}$

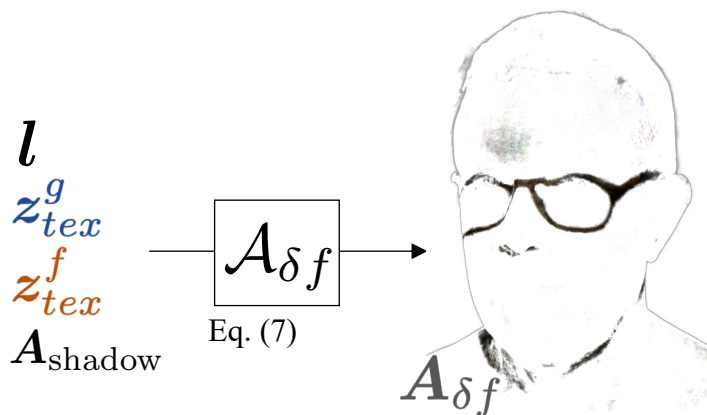
(d) Light Features



(e) Relightable Face



(f) Relightable glass



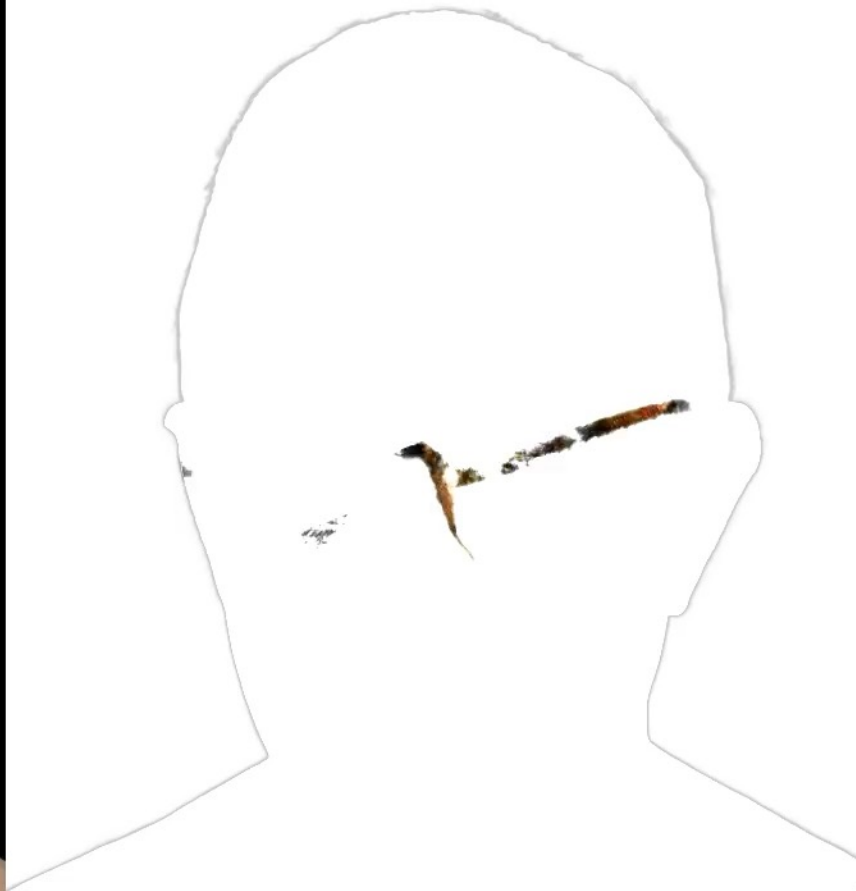
(g) Appearance Interactions



(h) Full Relighting

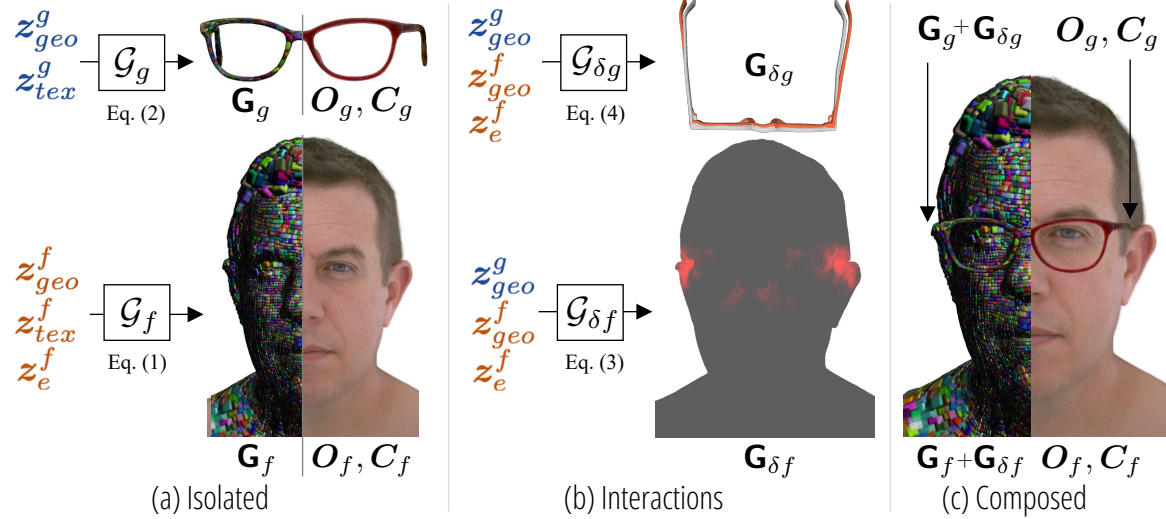


# Shadow Features & Est. Shadows

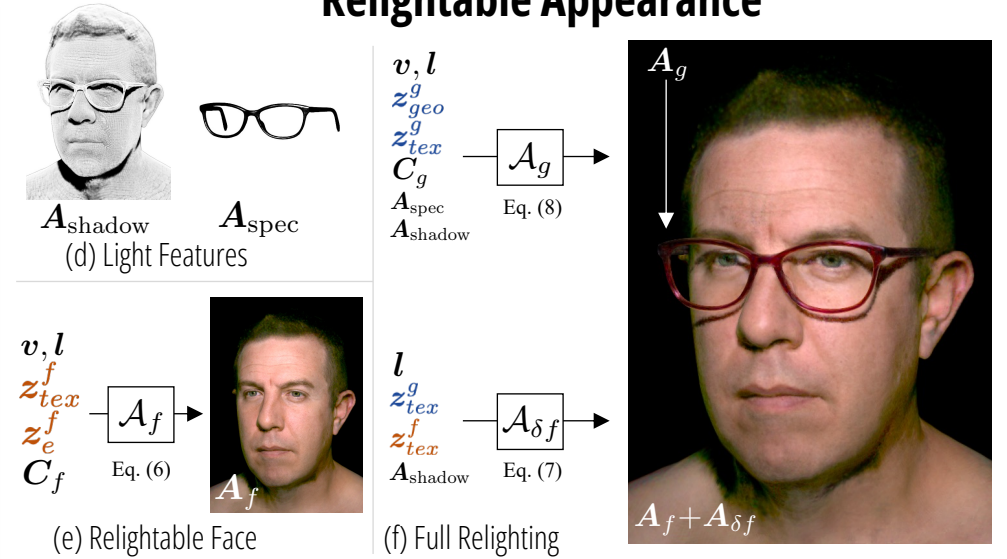


# Recap: Overview

## Morphable Geometry

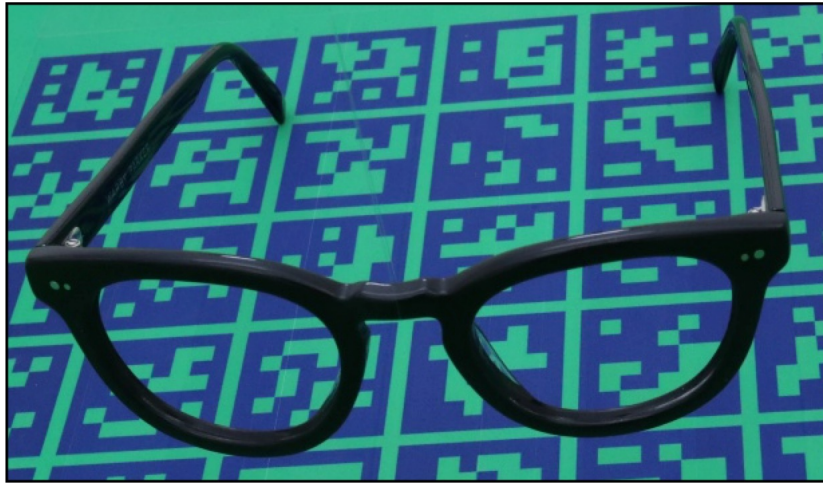


## Relightable Appearance



# Dataset

Eyeglasses Dataset



Face Dataset

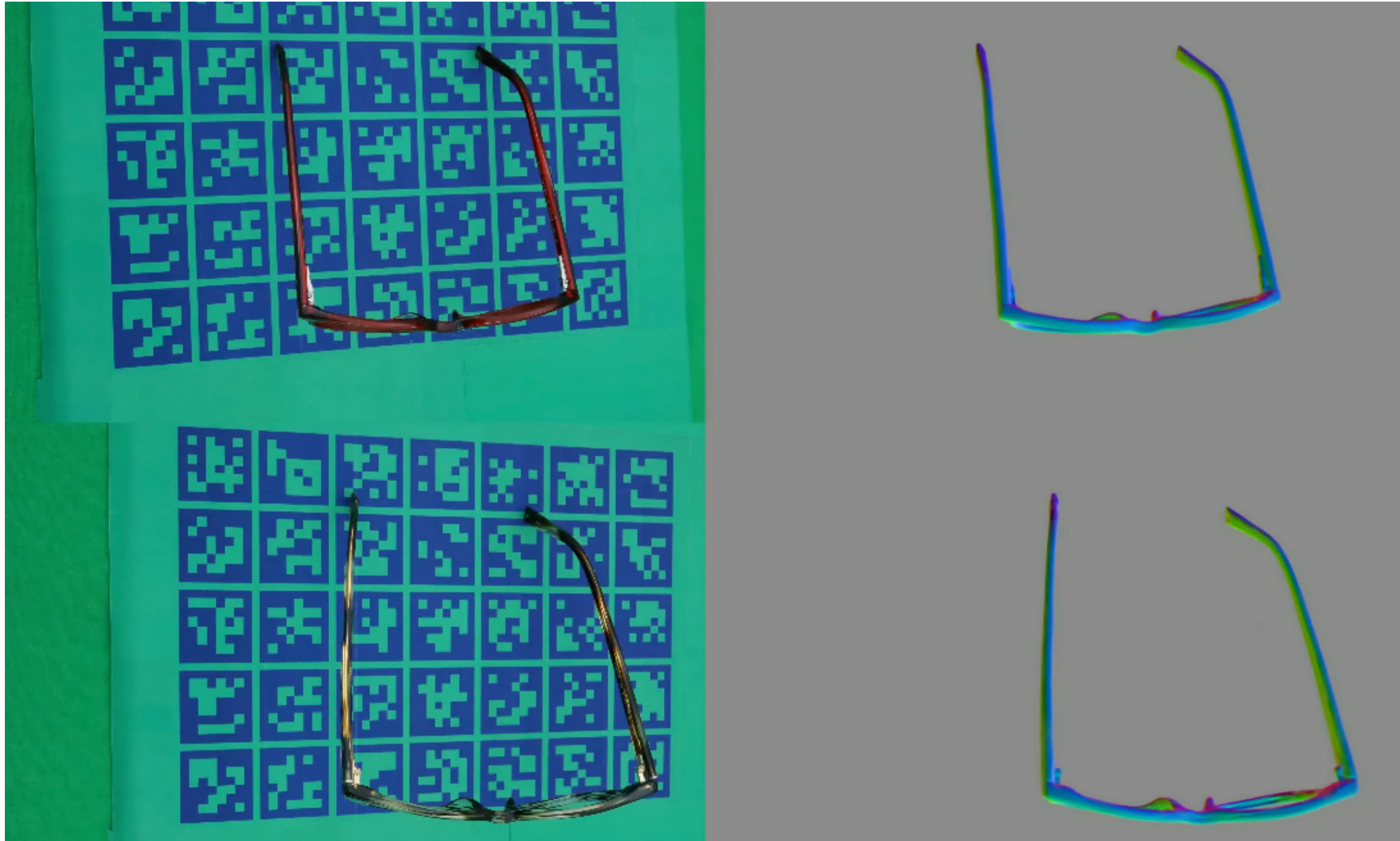


Face Wearing Eyeglasses





# Eyeglasses Dataset



We use Neus [Wang et al.] to reconstruct the mesh from Multiview images.



# Face and Face Wearing Eyeglasses Dataset



# Envmap Relighting & Lens Insertion



# Few-shot Reconstruction & Relighting



# Conclusion

## **M**orphable **E**ye**G**lass and **A**vatar **N**etwork (MEGANE)

- Compositable
- Morphable
- Relightable
- Geometric and Photometric Interactions with Faces
- Supporting Lens Insertion (w/ refraction & reflection)
- Few-Shot Fitting

