

# Next Generation 3D Face Models

Prashanth Chandran<sup>1</sup> 

<sup>1</sup>Google, Switzerland

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## Abstract

*Data driven 3D face models are an important tool for applications like facial animation, face reconstruction and tracking and can serve as a powerful prior for the complex nonrigid deformation of human faces. While linear 3D morphable models or 3DMMs have been traditionally employed by artists to cater to these applications, in the last few years several deep face models have been introduced that make use of neural networks to manipulate face shapes and offer greater flexibility while also retaining the intuitive control of traditional face models. This recent class of semantic deep face models have the potential to simplify existing facial animation workflows and enable artists to make a wider range of creative choices. However, as these neural tools are still very recent and fresh out of academic research, there is a need to start a conversation with artists and industry professionals on how such neural networks can be incorporated into existing workflows. This course aims to take a first step in this direction by providing a gentle introduction to several types of deep face models introduced in recent years by the academia and how each of them resolve several problems encountered in conventional facial animation. The primary intention of the course is to provide artists and industry professionals with an understanding of the state of art in neural 3D face models, and to inspire them to consider how these new tools can be incorporated into existing industry workflows to produce better content faster. The course will also serve the purpose of providing a gentle introduction to face modeling and animation to students looking to get familiar with the field. Experienced participants with a strong background in the field would also be able to identify possible directions for future research. The course will be presented in a lecture format with slides. Concepts from related papers will be explained in enough detail to help the audience make informed decisions on using these tools and understand their current shortcomings.*

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