

# FACAPP

FACIAL CAPTURE FOR DIRECTORS

## Overview

FACAPP is a new tool designed to bring facial capture into the hands of Directors, Actors and Animators in a simple and portable (COVID 19 safe) vehicle utilizing single camera or simple phone capture and previewed through either laptop or tablet.

## Project Description

The first stages of FACAPP would be seeking to integrate ARKit facial capture through iPhone or iPad using already existing Unreal Engine capabilities to retarget the performance onto any chosen head model. This would allow any iPhone, iPad or laptop to host a standalone application that anyone can open and immediately have the ability to start the facial capture. Very little to no set up is required by the user. Video of the performance along with the ARKit blend shape data could be saved to the device for sending on to third parties via email.

FACAPP eventually looks to provide a whole pipeline facial capture solution integrating an automatic facial blend shape application and single camera FACS scanning solution to create the time intensive prep work required prior to capturing and displaying live facial capture.

## Target Audience

*Directors* - Having worked alongside some of the most preeminent directors in facial capture the availability of this tool would allow them to capture and show the exact performance they are seeking when trying to convey an idea. It also allows them to test out ideas and capture performance for multiple actors for use in blocking or studio pitches.

*Actors* – A simple interface on readily available portable devices allows any actor, anywhere in the world to record a facial performance and send the data back to set, directors or animators. In the current COVID 19 era, this technique is already being talked about. FACAPP takes this further by simplifying, recording and sending the data for fast review and feedback.

*Virtual Production* – Similar to above, FACAPP allows actors to take part in virtual production shoots from anywhere in the world. The system also allows directors to record their own performance to be shown to the set prior to recording takes or prerecord performance to be played back by the virtual production system onto LED screens or other displays.

*Pre Production* – Pre vis teams will be able to quickly capture performance to apply to characters as and when script changes come through, allowing them to keep pre vis up to date quickly during the fast paced pre production period.

*VFX* – VFX Supervisors, Animation directors and animators will be able to record performance to share with their team. This performance could be used as reference for the facial animation department or utilized and refined further to form the basis of the final animation.

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## Existing methodologies

Currently it is possible to create live iPhone captures and display them in Unreal using existing tools, however the setup requires steps that are beyond the scope of Directors and actors and does not allow for unsupervised use by someone familiar with Unreal. FACAPP looks to build on this and add functionality to turn this feature of Unreal into a viable and much used everyday production tool.

## Project Stages

### *Stage 01 – creating functioning app*

- Create iPhone/iPad interface which utilizes Unreal engine and ARKit to capture facial data through the depth camera.
- Allow the user to either display their own performance or the retargeted CG character.
- Record facial blend shapes, video performance and sound performance to a device to be sent on at a later date.

### *Stage 02 – building on the interface*

- Allowing to playback a chosen take for review
- Live streaming of data to allow retargeting in another location
- Selecting different available characters to preview the recordings or capture

### *Stage 03 – Complete Facial Capture pipeline*

- Create a fully automated system to create the required facial blend shapes and maps to create high quality character quickly.
- Simple, single camera FACS scanning setups that can be setup quickly in a small space and operated by one other operator. Maintaining social distancing at all times.

## COVID 19 safe

FACAPP allows a portable and simple method for facial capture to be created anywhere in the world in the safety of the home utilizing their own existing devices or pre cleaned devices shipped to the home.

## Conclusion

FACAPP is seeking to remove the current technical setup required and make high fidelity facial capture as simple as imagining the performance in your head.

FACAPP is a system that would be used by leading film makers and VFX specialists on a daily basis placing Unreal at the forefront of the film making tools used from early conception of a project through to final VFX.

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## Example of current research

These examples show iPhone ARKit shapes we have captured and transferred to high fidelity FACS shapes utilizing multiple blood flow maps, wrinkle maps and normal maps etc.



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## FACAPP WORKFLOW FLOWCHART

