D3.5 VISUAL FACIAL ANIMATION REPORT

PRESENT

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Abstract	This Report describes the research developed to drive the facial animation of the digital agent. Our methods, progress and results are documented.
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3.0 27-02-2022	Final version - Addressed peer review feedback

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1.   EXECUTIVE SUMMARY

The main elements of the pipeline developed by Cubic Motion to create facial animation from captured performance data are presented in this deliverable. They include some key innovations: a new stereo head-mounted capture system, a new approach to extract detailed 3D geometric information from the actor's facial performance, the creation of a lightweight asset or facial rig of the actor Gareth Leighton, and a new methodology to solve the controls of the rig logic.

This pipeline has been used to capture and process performance data for the purposes of generating animation to drive the digital agent. This involved a number of motion capture sessions, recording performances to create suitable training data for animating the agent. These were used to develop a state model allowing the emotion of the agent to be driven within the Unreal Engine reference implementation, as well as carry out research work to create machine learning capable of manipulating animation style, in terms of both emotion and identity.

2.   BACKGROUND

D3.5 Visual Facial Animation Report is the second deliverable related to the facial animation task WP3T3 after D3.2 Interim Visual Facial Animation Demonstration. It also covers work on interactive facial animation in WP6T3.

The main aim of this deliverable is to describe the facial animation technology used to create realistic performance animation and how this is used in conjunction with generative animation techniques to drive the character in the Unreal Engine project reference implementation.

The methods described here will be refined and applied in WP8T4 Prototype Evaluations and WP9T3 Agent Demonstration.

3.   INTRODUCTION

This deliverable describes the main elements developed and used to create the underlying mechanisms that will animate the face of the virtual agent. The characteristics of the facial pipeline are detailed in section 4 and the generative animation technology is described in section 5. Videos have been created to accompany and illustrate this deliverable, as indicated in the following sections.

3.1.   Main objectives and goals

The main objectives of this deliverable are as follows:

1. Create a reliable and comfortable capture system to record high-quality stereo footage from the actor's facial performance.

2. Establish a pipeline to create facial animation of the virtual agent from the offline captured performance.

3. Customise this pipeline to provide the most optimal results for the actor Gareth for a wide variety of facial expressions and acting situations.