Realistic Avatars for Sign Language Synthesis

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Introduction

Our research focuses on developing a more natural avatar for Irish Sign language (ISL). We propose to build on the existing system developed by the Virtual Humans team at the University of East Anglia, Norwich. In this poster we demonstrate how we intend to integrate human factors into the Virtual Humans avatar by augmenting the SIGML and 3D rendering software. These additions should deliver a more human-like avatar, thereby improving sign language avatar quality.

State-of-the-art

- The current avatar designed at UEA is the state-of-the-art in Sign Language synthesis.
- Even the best avatars for SLs are comparable to the robotic and artificial nature of early speech synthesis output.
- The nuance of natural human movement is complex to simulate authenticially.
- There is a predominant absence of key factors that make animations more natural and human-like.

Future work

It is the aim of our work to address the absence of these key factors, we will:

- Define the specification of the non-linguistic attributes of the avatar such as weight shift, involuntary movements.
- Attempt to simulate natural variance in signs, e.g. to make the avatar less symmetrical when conducting two-handed signs.
- Build on existing non-manual features (NMFs): NMFs encompass any body movement not made by the arms and hands as well as representing emotion, intonation and intensification.
- We will focus primarily on the representing previously unaddressed NMFs including emotion, intonation and intensification as we believe these to be the most crucial components for Human-like SL synthesis.

Bibliography


Parallel corpus of approx 3D 200 English – ISL sentences transcribed manually ISL is transcribed using HamNoSys

HamNoSys-to-SiGML

SiGML

AnimGen

Animation Data

Mesh/skeleton structure, coordinates, camera location, rotation values

Real-Time 3D animation rendering software built during the eSigns and ViSiCAST projects

convert SIGML to a sequence of animation frames or "Animation data"

• HamNoSys is a well established transcription system (Prillwitz et al., 1989) • Phonetic based • purpose-built for use by Sign Language linguists • Consists of about 200 symbols

Bentele (n.d.)

• SIGML (Signing Gesture Mark-up Language) (Elliott et al., 2004) • Defines a set of XML tags for each phonetic symbol in HamNoSys • SIGML was developed over a three year period for the ViSiCAST and eSign projects. (Elliott et al. 2000; Kennaway, 2007)

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An utterance is entered in English

"morning"

English

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