Single-Person and Multi-Party 3D Visualizations for Nonverbal Communication Analysis

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Introduktion
ANVIL is a free video annotation research tool
Annotation of events (gestures, words, movements ...) on time-aligned tracks
Visualization of human motion recordings (motion capture) with a 3D viewer

Goals
Increase readability of human motion and multi-party relations in 3D
Make coding more reliable
Enhance qualitative analysis for gesture research
Multimodality research
Sign language research
Social sciences

Means
Supportive 3D visualizations
Correspondence with conventional annotations (color coding)
Objective numerical measures (e.g. hand-to-hand distance)
Automatic coding

Single Person

Body Movement
- Hip movement
- Direction arrow
- Speed ~ disc radius
- Thresholding / grey = no motion

Hand Movement
- Hand movement (wrist)
- Direction arrow
- Speed ~ arrow length

Gesture Space
- McNeill's (1992) gesture space (18 sectors in the frontal plane)
- Hand(s) in sector => highlighted (RH: yellow, LH: green, 2H: red)
- Gesture space follows body
- Upper body tilt is ignored

Multi-Party

Distance
- Proxemics: Interpersonal space, defined by distance, is meaningful (Hall, 1966)
- Configurable zones (intimate, personal, social, public)
- Depicted with an ellipse
- Ellipse thickness ~ distance
- Zones color-coded

Relative Movement
- Is A approaching B, retreating or moving sideways?
- Reuse single-person movement visualization (disc & arrow)
- Interlocutor's position shown as small dot on disc (like a radar)

Orientation
- People interact in F-formations, defined by orientation (Kendon, 1990)
  (1) Individual orientation as divergence from face-to-face direction (at feet)
  (2) Common angle between two torso directions (between figures)

Future Work
- Evaluation: Do 3D visualizations make coding more reliable?
- Versatile video player (VLC, JavaFX)
- Automatic Annotation
- Modernize GUI technology (JavaFX, 3D, mobile)

References