



Understanding (Arabic) Nonverbal Behavior

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MSR

Problem

- **Nonverbal behavior analysis is critical to understanding others, but is under-utilized:**
 - **Current (limited) sponsor use is largely intuition-based**
 - **Relevant scientific knowledge resides in islands of lab-based research, mostly on Western culture**
 - **No standards, little interoperability of nonverbal annotations or analyses**
 - **No clear routes to practical sponsor applications**

Background

A variety of nonverbals can aid (or impede) understanding

Pointing (rude in some cultures)



www.aljazeeraah.info/Islam/Gallery%20of%20news%20pictures/Dec%202002%20news_photos.htm



www.army.mil/operations/oif/images28.html

Gaze

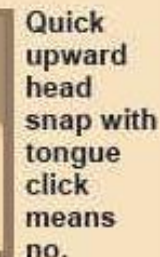
Interpersonal space (differs between cultures)



www.carlisle.army.mil/usacs/mark



www.slate.com/id/2080812



cryptome.org/iraq-culture.htm

Emblems (cultural-specific meanings)

Objective

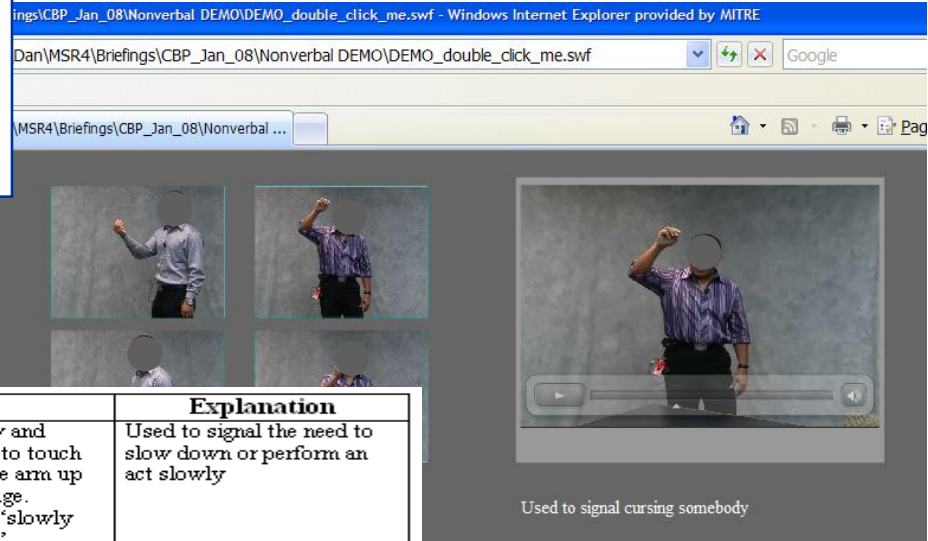
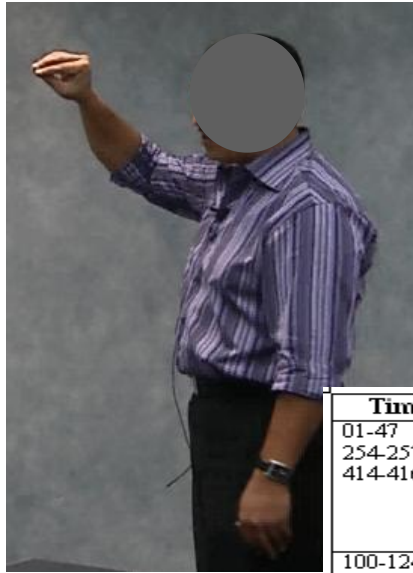
1. Provide **enabling technology** for annotating, analyzing, and sharing nonverbal data
2. Use the enabling technology to understand and utilize nonverbal behavior from **specific cultures**
 - Starting with an Arabic-speaking culture
 - Create, annotate, analyze, and share data (FY08)
3. Apply findings to **practical sponsor use**
 - E.g. Improve game-character nonverbal behavior realism in serious games training scenarios (FY08)

Activities

- Creating **interoperability tools and standards** so (expensive) data-sets can be shared
- **Creating data-sets** (videotapes/annotations) of Arabic speakers with sponsor-relevant operational experience (FY08)
- **Analyzing data-sets** to glean new understandings (FY08)
- Creating **component building blocks** for sponsor use – see following slides (FY08)

Highlight

Start of validated socio-cultural knowledge base (KB)



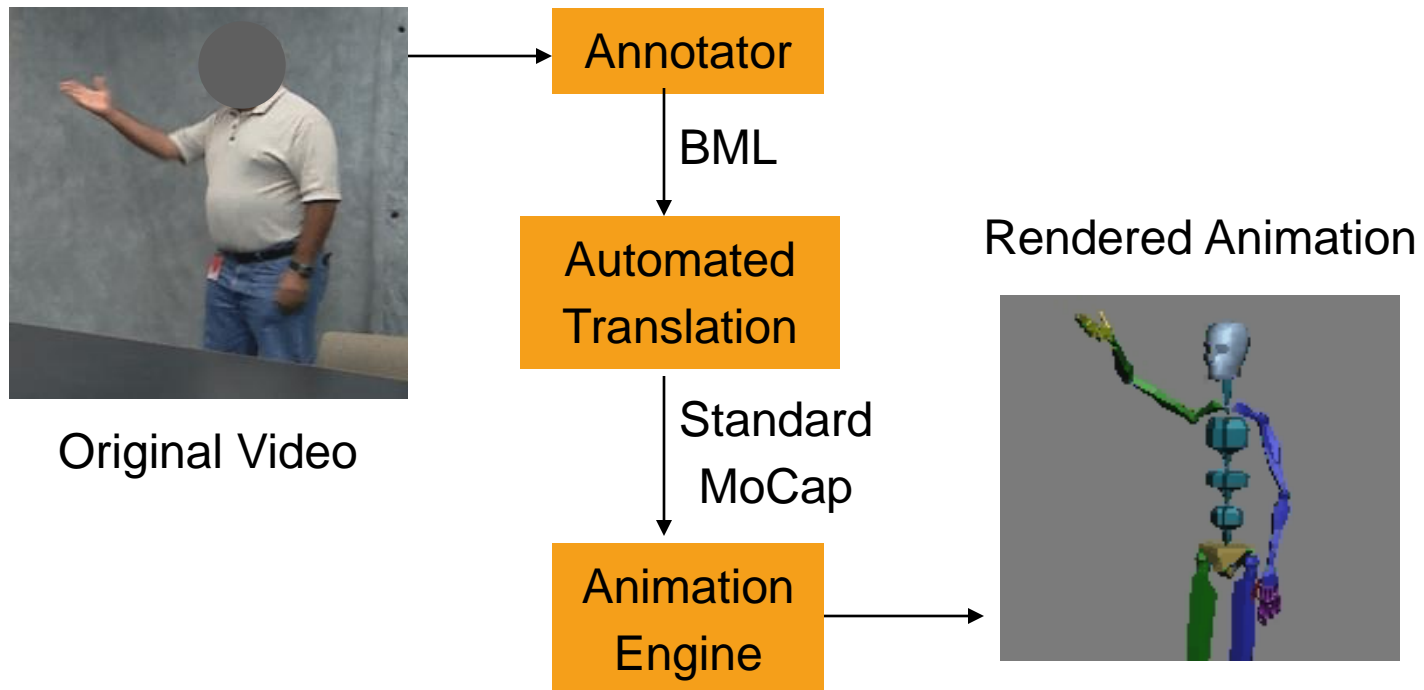
Time	Description	Explanation
01-47 254-257 414-416	Bending the right arm at the elbow and grouping the four fingers together to touch the thumb, followed by moving the arm up and down using the elbow as a hinge. Usually accompanied by saying: "slowly slowly" or " <i>showerah showerah</i> "	Used to signal the need to slow down or perform an act slowly
100-124 421-424 526-540	Bending the right arm at the elbow and grouping the four fingers together to touch the thumb, followed by stiffly moving the arm up and down using the elbow as a hinge. Arm is kept close to the right side of the hip. Usually accompanied by saying: "just you wait" or " <i>ma'ithar</i> ."	Used to signal the intent to get even, or threaten mildly
259-303 400-413	Raising both arms with the palms open and facing forward, with quick back and forth motion of the hands using the wrist as a hinge.	Used to signal the need to slow down or go backwards. Not a polite motion.
331-342 430-438	Raising the right arm along the right side of the body above the head with hand facing forward, and curling the four fingers together to touch thumb, followed by quick back and forth motion of the hand using the wrist as a hinge.	Used to signal cursing somebody
355-400 424-429 514-615	Raising the right arm along the right side of the body to head level and pointing the index finger toward another party, with quick back and forth motion of the hand using the wrist as a hinge.	Used to threaten seriously
728-745	Raising a hand and pointing it toward a person. The pointing is done using all five fingers outstretched and with palm facing to the side	Used to emphasize discomfort. Signals belligerence when accompanied by loud voice.

Corpus informs KB

KB uses:
 - training
 - analysis
 - animation
 - simulation
 - operations

Demonstration

- Behavioral Markup Language (BML) is an annotation language for describing nonverbal behavior
- We convert it to a format for animation engines (Biovision motion capture (MoCap)).



Impacts

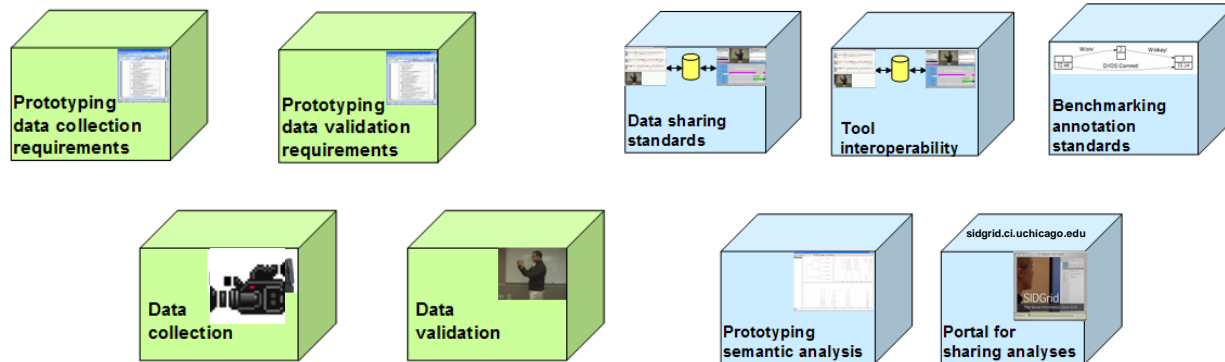


- **New standard for multimodal data exchange**
- **Prototype of validation requirements for cultural data**
- **Annotated corpus of selected Iraqi nonverbals**
- **Improved standard for high-level animation scripting**
- **Interoperable library of selected nonverbal animations**

Future Plans

■ Formalize behavioral analysis using:

1. Data collection & annotation (akin to successful use in language technology)



2. Integration of ethnography, research, & technology for specific applications

