Virtual Sign translator in Serious Games
Virtual Sign

- Graphics, Interaction and Learning Technologies
Main Goals

Human Computer Interaction

Implementation of a bidirectional translation system for **Portuguese Sign Language (LGP)**
- Focused primarily on educational and didactic aspects
Scope:
- configuration and movement of the hands;
- body position/inclination;
- facial expressions;

Detect all!
Body Position

Human Computer Interaction
Configuration and Movement of the Hands

Human Computer Interaction
Facial Expression

Human Computer Interaction
System Components

- Depth Sensor (Kinect)
- Data Gloves (5DT)

Human Computer Interaction
Challenges

Human Computer Interaction

Words:
- Sequential combination of movements and hands configurations;
- Significant variations in execution speed, hands and body position;
- Hard to understand where each word begins and ends;
There are 54 possible hands configurations (states); A word is defined by a transition from an initial to a final state; Each state transition has an associated movement;
Divide and Conquer

Bom Dia!

Human Computer Interaction
First Step

Human Computer Interaction

Detect transitions between hands configurations:
  • Using data from the gloves to classify the configurations;
Describe the movement of the hands and arms:
• Using kinect to estimate the velocity, position and orientation;
Third Step

Words classification:
• Finite Automata
• Algorithms for Hierarchical Classification
• Sequence Alignment Algorithms
Virtual Sign Application

Translation Through an Avatar
Virtual Sign Application

Translation Through an Avatar
Virtual Sign Application

Translation Through an Avatar with Kinect
Virtual Sign Application

Chat with Translation Through an Avatar
Virtual Sign Application

Sign Language Didactic Game
Virtual Sign Application

Sign Language Didactic Game
Virtual Sign Application

Thank you