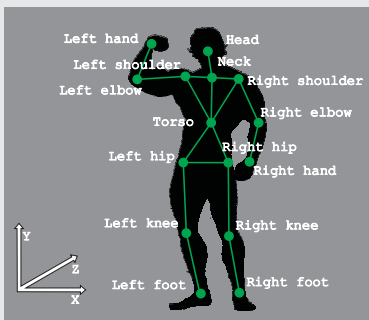


Introduction

- This paper presents our new proposition of human body poses and gesture description methodology for natural user interfaces.
- Our approach is based on forward chaining inferring schema performed on the set of rules that are defined with formal LALR grammar.
- The set of rules is called Gesture Description Language (GDL) script while automated reasoning module with heap-like memory is a GDL interpreter.



(GDL) script while automated reasoning module with heap-like memory is a GDL interpreter.

- We implemented and tested our initial GDL specification and we have obtained very promising early experiments results.

Elements of GDL

- Data types: number, point 3D, logical value, gesture sequence, rule.
- Operators: relational operators, arithmetic operators, logical operators.
- Functions: logical functions, numeric functions, sequence checking functions, point 3D functions.
- Others: brackets, commentary.

Examples

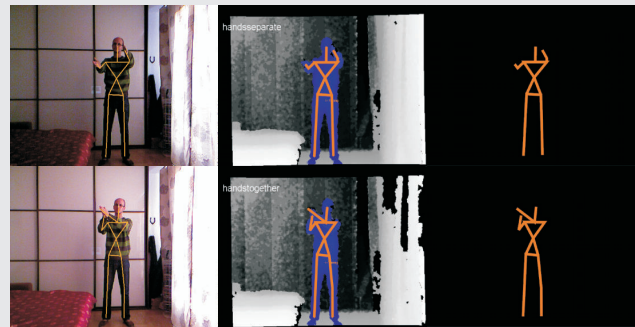
GDL script that detects movement of the tracked user.



```
RULE Distance(torso.xyz[0], torso.xyz[1]) > 10
THEN Movement
```

GDL script that detects “Psi pose” of the tracked user.

```
RULE RightElbow.x[0] > Torso.x[0]
& RightHand.x[0] > Torso.x[0]
& RightHand.y[0] > RightElbow.y[0]
& abs(RightHand.x[0] - RightElbow.x[0]) < 50
& abs(RightShoulder.y[0] - RightElbow.y[0]) < 50
THEN RightHandPsi
RULE LeftElbow.x[0] < Torso.x[0]
& LeftHand.x[0] < Torso.x[0]
& LeftHand.y[0] > LeftElbow.y[0]
& abs(LeftHand.x[0] - LeftElbow.x[0]) < 50
& abs(LeftShoulder.y[0] - LeftElbow.y[0]) < 50
THEN LeftHandPsi
RULE RightHandPsi & LeftHandPsi THEN Psi
```



GDL script that detects hand clapping along horizontal axis.

```
RULE abs(RightHand.x[0] - LeftHand.x[0]) < 80
& abs(RightHand.y[0] - LeftHand.y[0]) < 80
THEN HandsTogether
RULE abs(RightHand.x[0] - LeftHand.x[0]) > 80
& abs(RightHand.y[0] - LeftHand.y[0]) < 80
THEN HandsSeparate
RULE sequenceexists("[HandsSeparate,0.5]
[HandsTogether,0.5][HandsSeparate,0.5]")
THEN Clapping
```

GDL script that detects hand clapping and is axis invariant.

```
RULE distance(RightHand.xyz[0],LeftHand.xyz[0]) < 100
THEN HandsTogether
RULE distance(RightHand.xyz[0],LeftHand.xyz[0])>=100
THEN HandsSeparate
RULE sequenceexists("[HandsSeparate,0.5]
[HandsTogether,0.5][HandsSeparate,0.5]")
Then Clapping
```