



AR Summer School

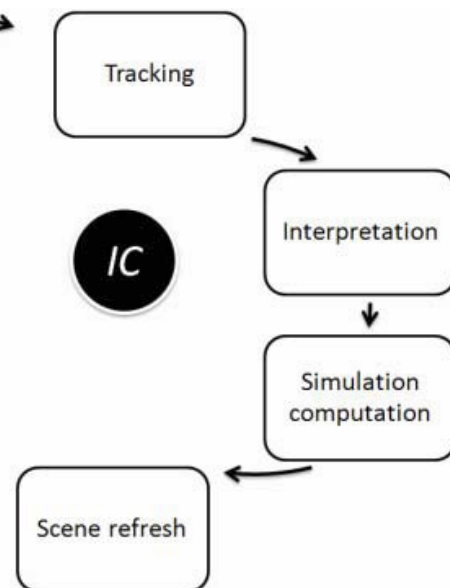
*«VRPN Interaction Server FFAST »*

**Dr. Taha Ridene**

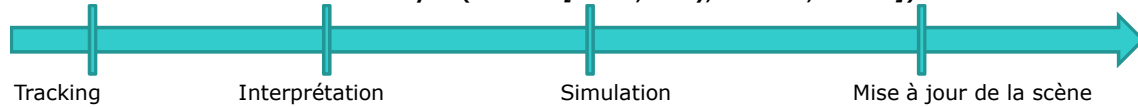
[taha.ridene@mines-paris.org](mailto:taha.ridene@mines-paris.org)

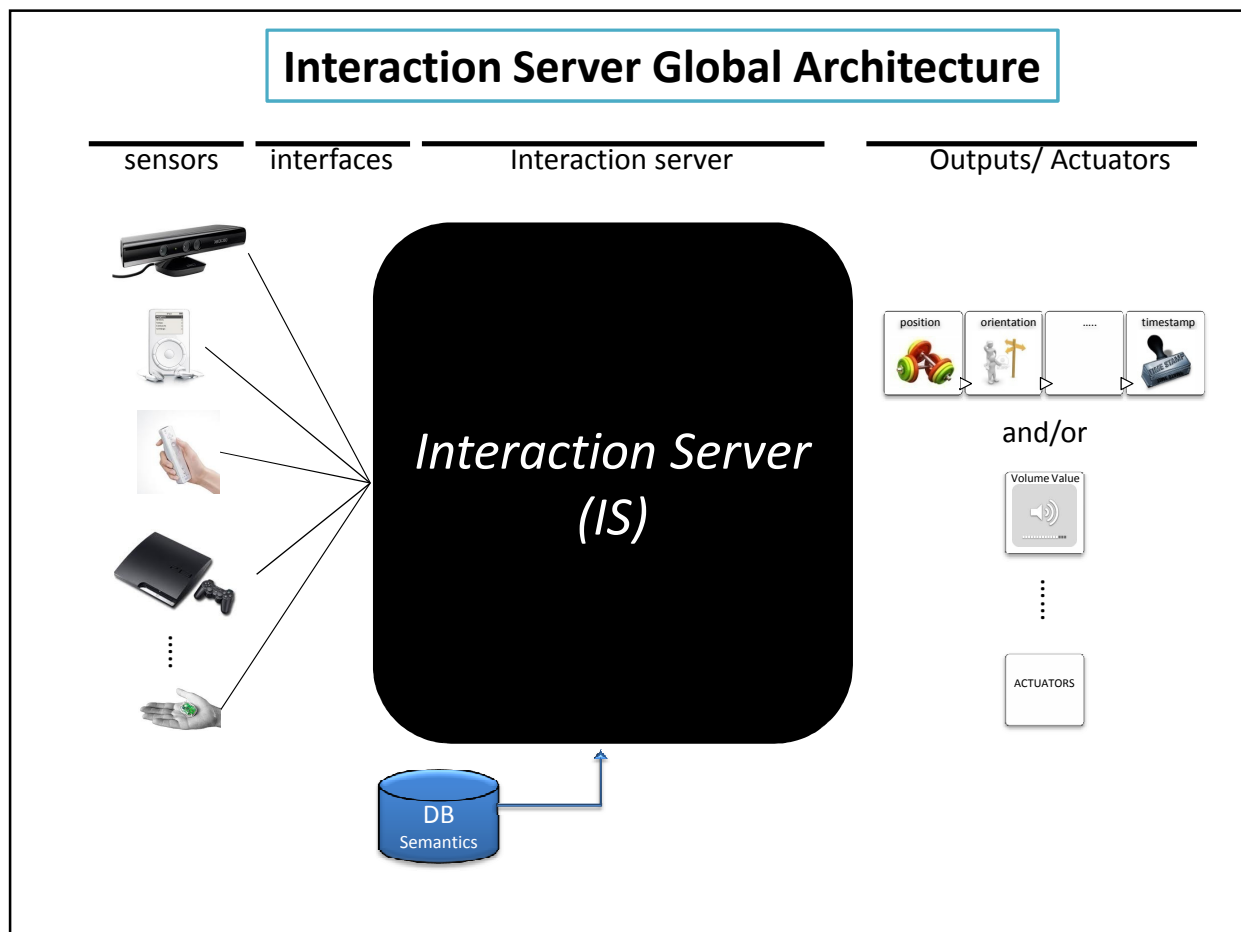
[taha-ridene.com](http://taha-ridene.com)

## *Cycle d'Interaction*



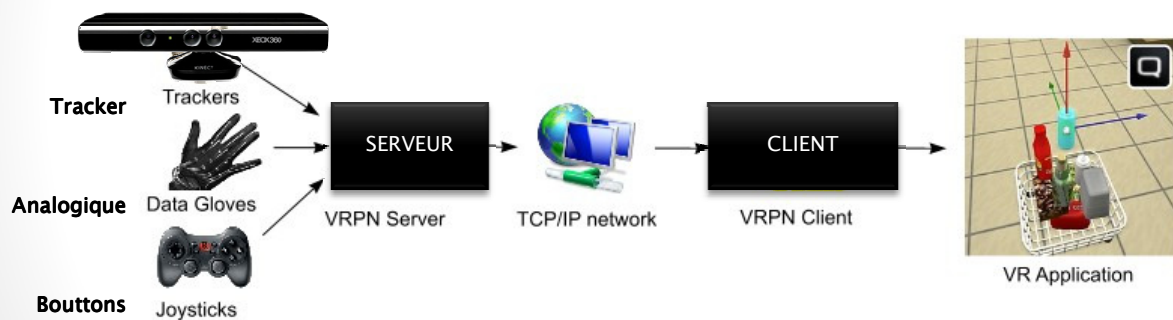
Interaction Cycle (source - [ridene, Leroy, Chendeb; VR-SIX])





# VRPN

## ► Communication Protocol



## ► Utile pour clustering ou partage

# VRPN

## ► Data Type

### Button

Binary button : **Boolean** 0/1 joystick button, mouse button, wiimote buttons

### Tracker

Position : **Vecteur** kinect, wand

Orientation : **Quaternion** wand, PlayStation move, boussole iPhone

### Analog

Axis : **Float** joystick, mouse, accelerometer wiimote...

Analog Button : PSMove

### Kinect's Xbox Depth Sensor FOV characteristics

- Horizontal FOV : 57 degrees
- Vertical FOV : 43 degrees
- Tilt angle : from -27 degrees to 27 degrees
- Range : from 1.2 to 3.5 meters

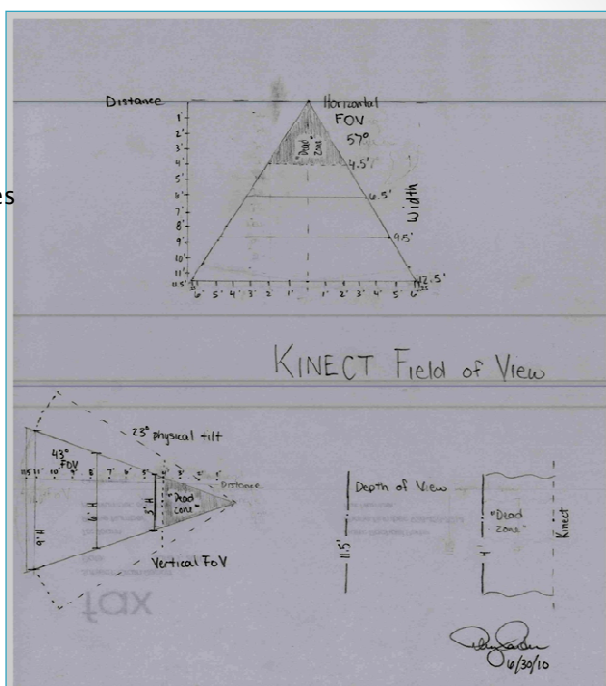
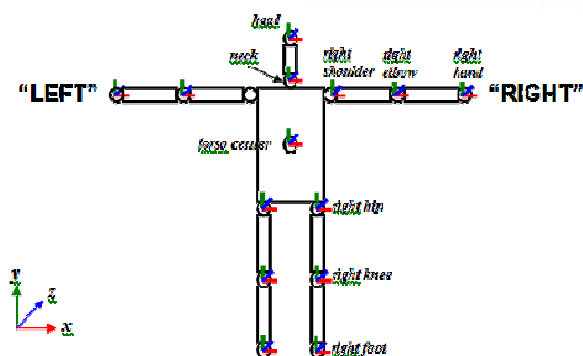
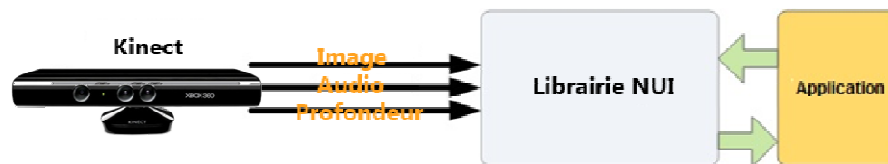


Diagram showing the Kinect Xbox FOV by Mr. Riley Porter

# KINECT



NOTE 1: Skeleton's front side is seen in this figure  
 NOTE 2: Upper arm is twisted such that if elbow is flexed  
 the lower arm will bend forwards towards sensor.

# Sound

## ▶ CAMERA DE PROFONDEUR

- 320x240 ou 80x60
- Données sous forme de stream
  - Événementiel / Pooling
- Stockage sur 13 bits
  - 10 bits pour la distance en millimètres depuis le capteur
  - 3 bits pour donner l'index de la personne reconnue

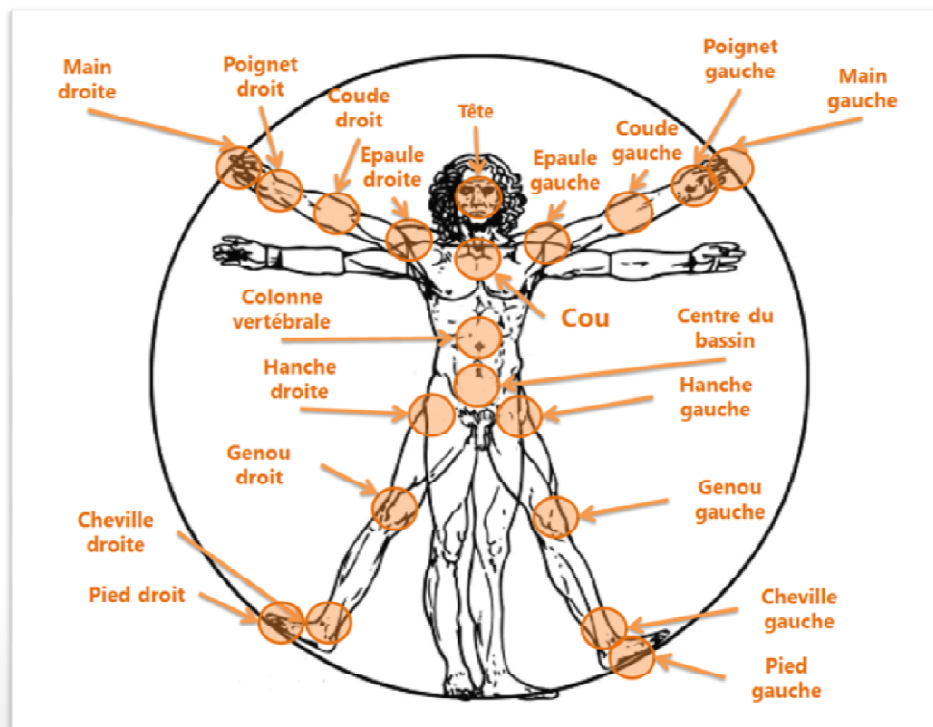


## ▶ SON

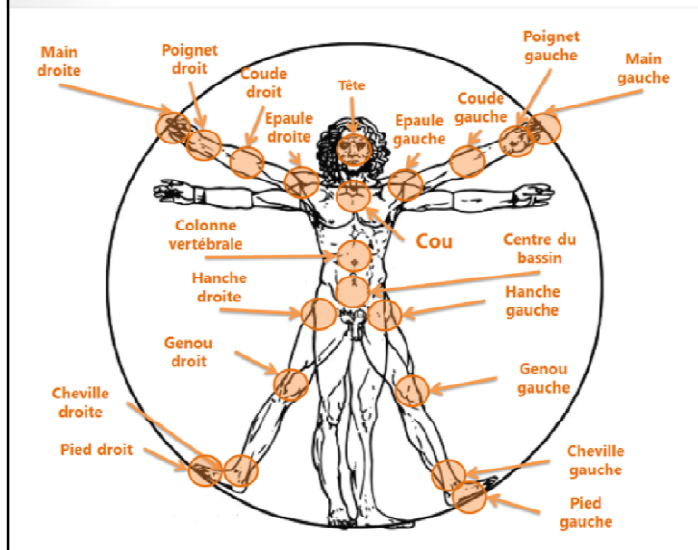
- Un groupe de 4 microphones (Microphone array)
- Des algorithmes de
  - Réduction du bruit ambiant
  - Annulation de l'écho
- Beamforming :
  - Tracking de la source sonore
- Compatible avec Microsoft Speech API



# KINECT



# KINECT



Sensor	Joint	Sensor	Joint
0	Head	12	Right Elbow
1	Neck	13	Right Wrist
2	Torso	14	Right Hand
3	Waist	15	Right Fingertip
4	Left Collar	16	Left Hip
5	Left Shoulder	17	Left Knee
6	Left Elbow	18	Left Ankle
7	Left Wrist	19	Left Foot
8	Left Hand	20	Right Hip
9	Left Fingertip	21	Right Knee
10	Right Collar	22	Right Ankle
11	Right Shoulder	23	Right Foot