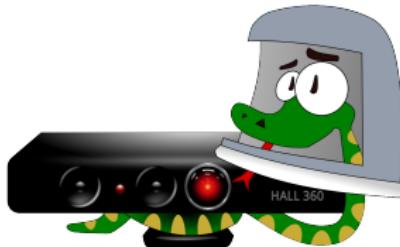


# 3D sensors and Python: A space odyssey

Celia Cintas

EuroPython 2014

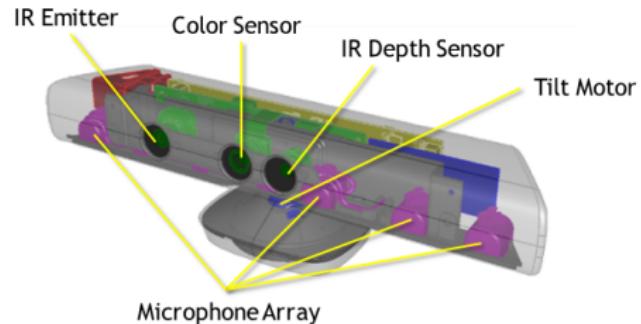


# \$ whoami

- PhD Student in Computer Science.
- Assistant Professor at UNPSJB.
- Work in CENPAT-CONICET and Imaging Science Lab.
- Co-Organizer of SciPyCon Argentina.



# HAL 9000 Jr. - The Hardware



[autoplay,loop, height=5cm]10!Imagenes/gif/my\_pngfiles037http://structure.io/openni



# Where can I run it ...??

- Linux (x86, x64, ARM)
- Mac OS X (x64 Intel Processors)
- Windows (x86, x64)



# What can I do with it?



Images from Smart Terrain™ of Vuforia™, xbmc, ninja-fruit, Ni-Mate, Artec Studio and QBo Robot



# Python bindings

- PyOpenNI

<https://github.com/jmendeth/PyOpenNI>

- primesense

<https://pypi.python.org/pypi/primesense/2.2.0.30-3>



# Context and Generators

```
[block, fill=red!30] (init) Create  
and initialize Context; [block,  
below of=init] (generators)  
Create and start Generators;  
[block, below of=generators]  
(wait) Wait and update Con-  
text; [block, below of=wait]  
(do) Do something and Visu- Different ways to work with a  
alize it; [block, below of=do] context:  
(stop) Stop Generators and Re-  
move Context; line] (init)  
--(generators); \pathline]  
(generators) - (wait); line]  
(wait)--(do); \pathline]  
(do) - (stop); line] (do.
```



# Context and Generators

```
[block] (init) Create and  
initialize Context; [block,  
below of=init, fill=red!30]  
(generators) Create and start  
Generators; [block, below  
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something and Visualize it;  
[block, below of=do] (stop)  
Stop Generators and Re-  
move Context; line](init)  
--(generators); \pathline]  
(generators) - (wait); line]  
(wait)--(do); \pathline]
```

- Image, Depth, IR Generator
- User, Gesture, Hand Generator
- User Generator has pose and skeleton Capabilities
- Register Callbacks to do specific task
- Start / Stop with Generator
- Set up fps, resolution, etc.



# Context and Generators

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[block] (init) Create and  
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Stop Generators and Re-  
move Context; line] (init)  
--(generators); \pathline]  
(generators) - (wait); line]  
(wait)--(do); \pathline]
```

You can choose when you want to  
get new data:



# Context and Generators

```
[block] (init) Create and
initialize Context; [block,
below of=init] (generators)
Create and start Generators;
[block, below of=generators]
(wait) Wait and update
Context; [block, below
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Do something and Visualize it;
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Stop Generators and Re-
move Context; line](init)
--(generators); \pathline]
(generators) - (wait); line]
(wait)--(do); \pathline]
```

Some things that you can do:



# Context and Generators

```
[block] (init) Create and  
initialize Context; [block,  
below of=init] (generators)  
Create and start Generators;  
[block, below of=generators]  
(wait) Wait and update Con-  
text; [block, below of=wait]  
(do) Do something and  
Visualize it; [block, below  
of=do, fill=red!30] (stop)  
Stop Generators and Re-  
move Context; line] (init)  
--(generators); \pathline]  
(generators) - (wait); line]  
(wait)--(do); \pathline]
```

Ways to stop data acquisition:



# Demo Time



# Skeleton Basics

## Skeleton and Pose Capabilities

- Profile
- Joints
- Start/ Stop Calibration
- Start/ Stop Tracking



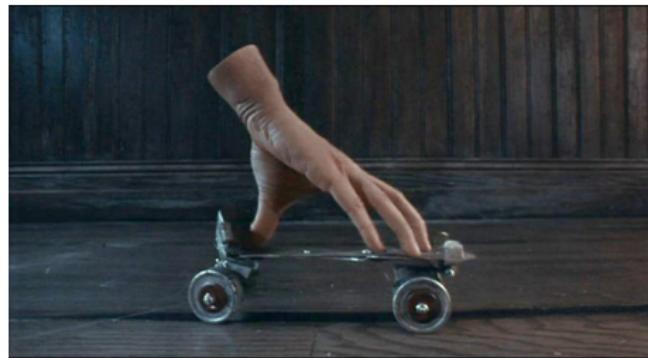
# Demo Time



# Hand and Gesture tracking

## Gesture and Hands Generator

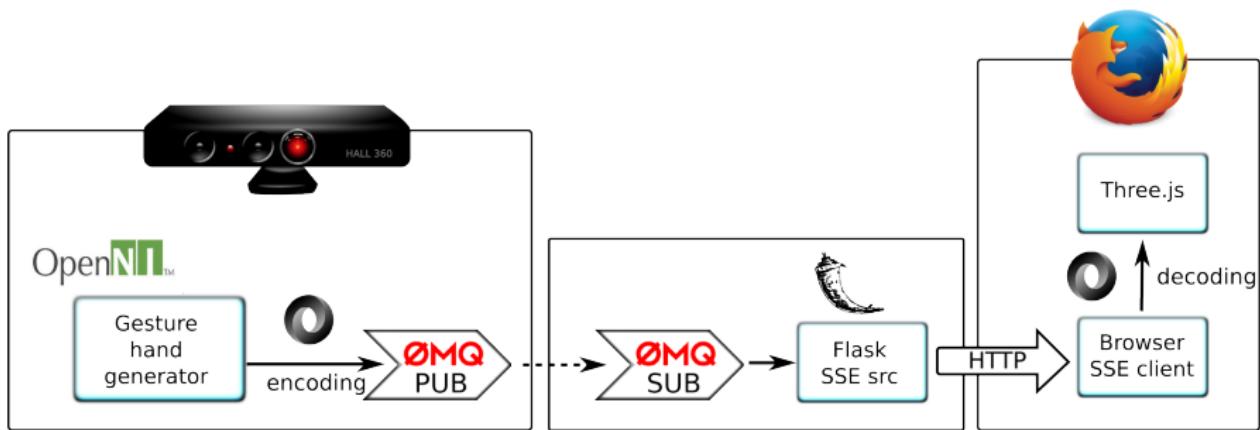
- Add/Remove Gestures  
(Wave, click, etc)
- Start/ Stop Tracking



# Demo Time

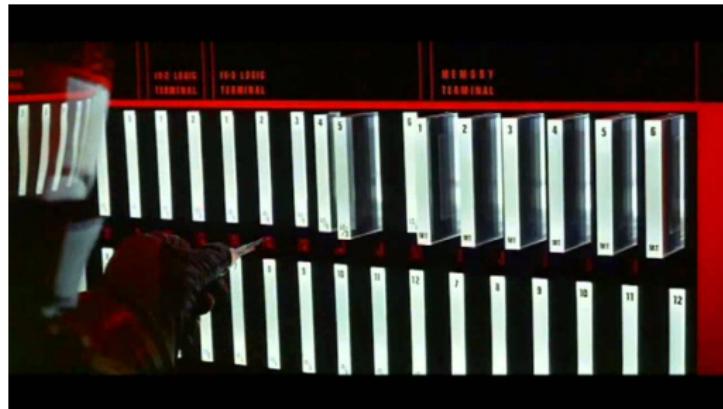


# For the final demo ...



# Q&A

# Thank you!



- [https://github.com/celiacintas/3dsensors\\_talk](https://github.com/celiacintas/3dsensors_talk)
- <https://github.com/jmendeth/PyOpenNI>
- <http://structure.io/openni>

