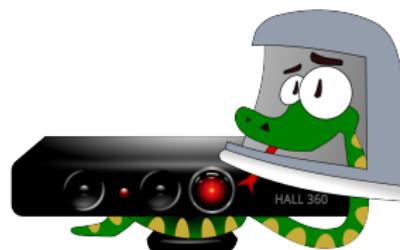


3D sensors and Python: A space odyssey

Celia Cintas

EuroPython 2014

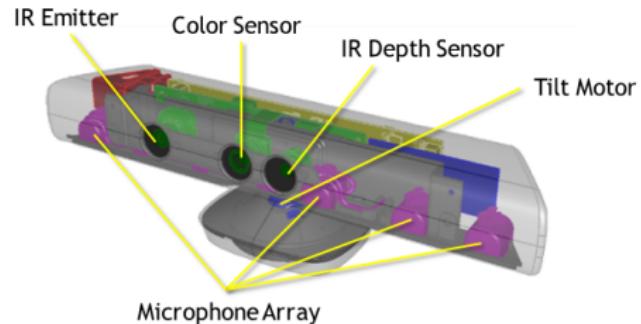


\$ whoami

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



HAL 9000 Jr. - The Hardware



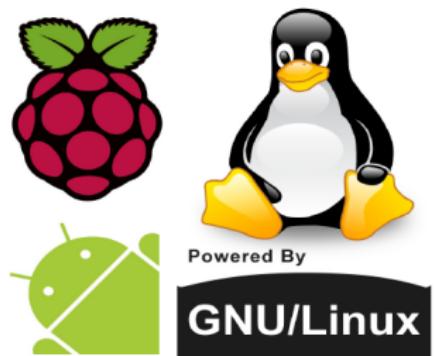
What is OpenNI Framework - NITE ??

<http://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

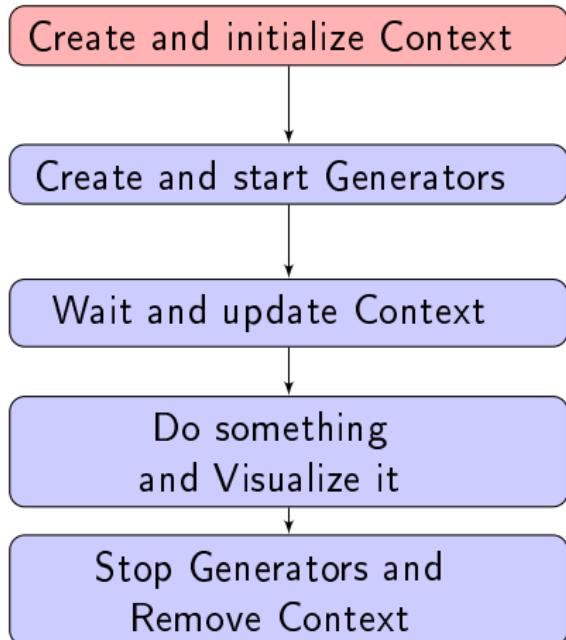


Python bindings

- PyOpenNI
(<https://github.com/jmendeth/PyOpenNI>)
- primesense
<https://pypi.python.org/pypi/primesense/2.2.0.30-3>)



Context and Generators



Different ways to work with a context:

```
ctx.init()
```

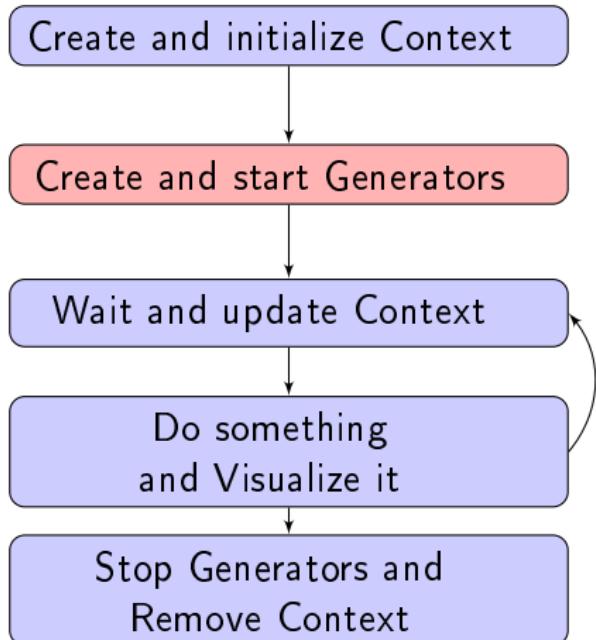
```
ctx.init_from_xml_file('conf.xml')
```

```
ctx.find_existing_node(type_node)
```

```
ctx.open_file_recording('rec.oni')
```



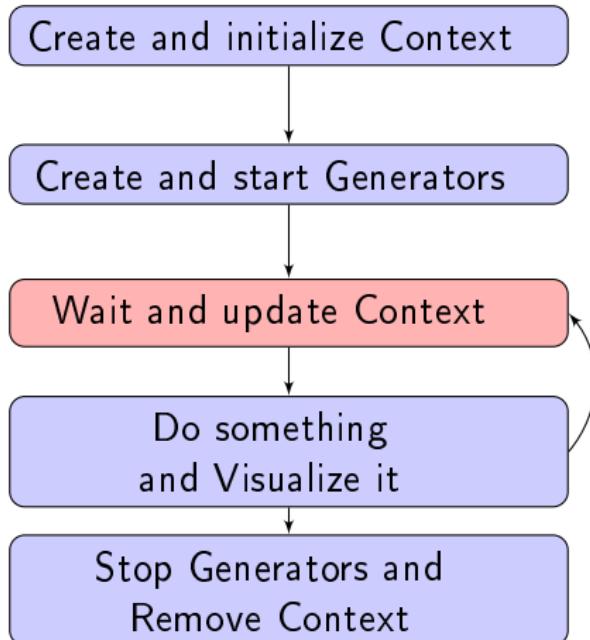
Context and Generators



- 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



You can choose when you want to get new data:

`ctx.wait_and_update_all()`

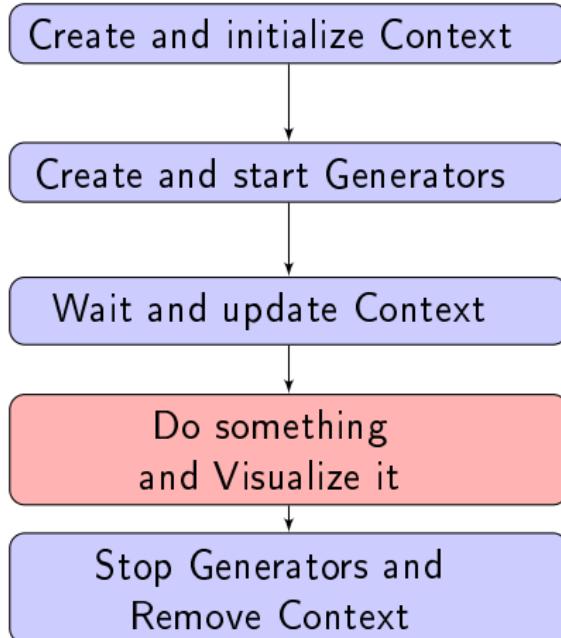
`ctx.wait_none_update_all()`

`ctx.wait_any_update_all()`

`ctx.wait_one_update_all(node)`



Context and Generators



Some things that you can do:

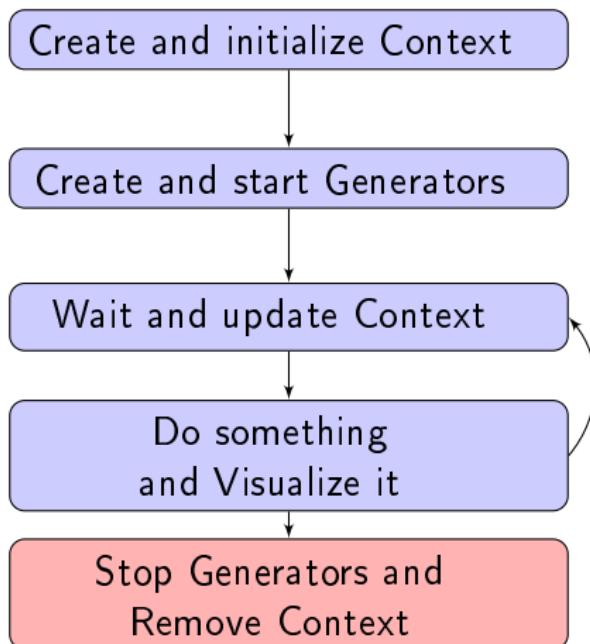
`depth_gen.get_tuple_depth_map()`

`skel.get_joint_position(id, i)`

`image_gen.get_raw_image_map_bgr()`



Context and Generators



Ways to stop data acquisition:

`ctx.stop_generating_all()`

`node_gen.stop_generating()`

`ctx.shutdown()`



Demo Time



Skeleton Basics

Skeleton and Pose Capabilities

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



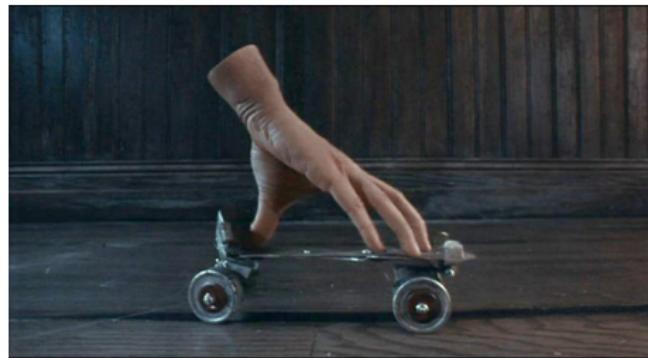
Demo Time



Hand and Gesture tracking

Gesture and Hands Generator

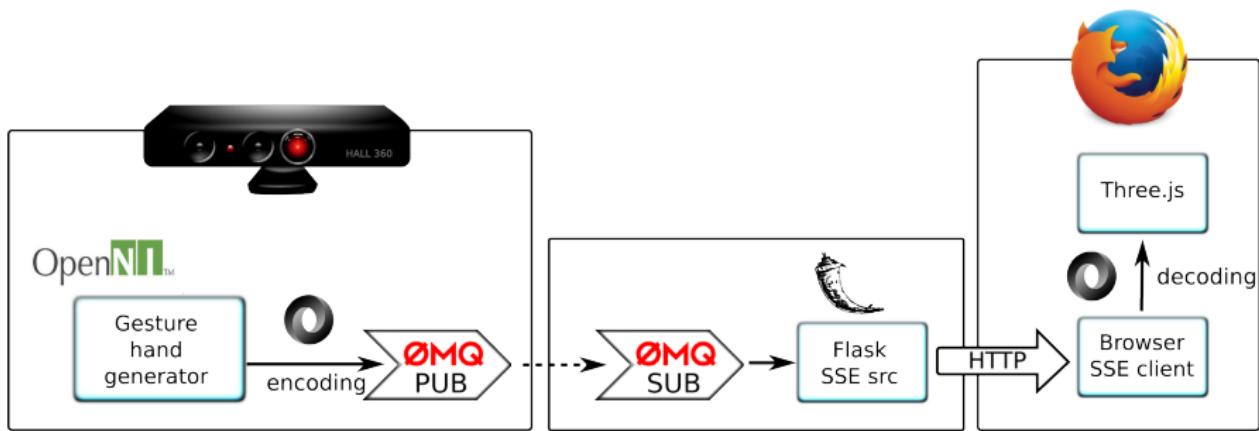
- Add/Remove Gestures
(Wave, click, etc)
- Start/ Stop Tracking



Demo Time

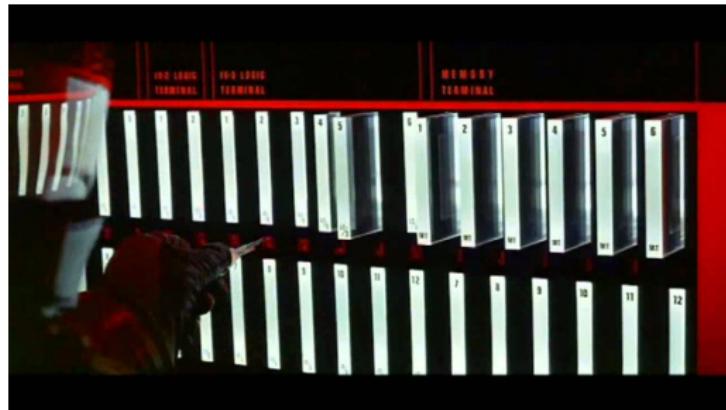


For the final demo ...



Q&A

Thank you!



- https://github.com/celiacintas/3dsensors_talk
- <https://github.com/jmendeth/PyOpenNI>
- <http://structure.io/openni>

