



CSCI 1108

Introduction to Experimental Robotics

Software environments for robotics
and
Simulator

Aseba Studio

The screenshot displays the Aseba Studio interface for a thymio-II robot. The main window is titled "Untitled - Aseba Studio" and contains a "Code Area" with the text "Code Area" in red. The interface is divided into several panels:

- Execution:** Includes buttons for "Load", "Run", "Reset", and "Next". The status is "unknown".
- Variables:** A table showing the current state of variables, highlighted with an orange border. It includes a "Filter" input field and a "refresh" button.
- Constants:** A panel for defining constants, currently empty.
- Global Events:** A panel for monitoring global events, currently empty.
- Native Functions, Local Events, Local Tools:** Panels for managing these elements, currently empty.
- Launch VPL:** A button to launch the Visual Programming Language.
- Memory usage:** A status bar at the bottom indicating "Memory usage : variables: 92 on 604 (15.2%), bytecode: 1 on 1534 (0.1%)".
- Compilation success:** A green checkmark indicating that the code has been compiled successfully.
- Global Events Log:** A list of events with timestamps and IDs, such as "11:55:48.249 event 0 : 567 534".

names	values
_id	1
event.source	1
▶ event.args	(32)
▶ _fwversion	(2)
▶ _productId	8
▶ buttons._raw	(5)
button.backward	0
button.left	0
button.center	0
button.forward	0
button.right	0
▶ buttons._mean	(5)
▶ buttons._noise	(5)

<https://aseba.wikidot.com/en:thymioapi>

Android™ Based Robotics

Nicolas Oros, Jeffrey Kritchmar

<https://youtu.be/2czndpV6pWw>



Robotics Software Environments

- Ubuntu (Unix OS)



- ROS (Robot Operating System)

www.ros.org

Subscription architecture, wide range of services, many robots have ROS nodes



- OpenCV (Open Computer Vision)
opencv.org

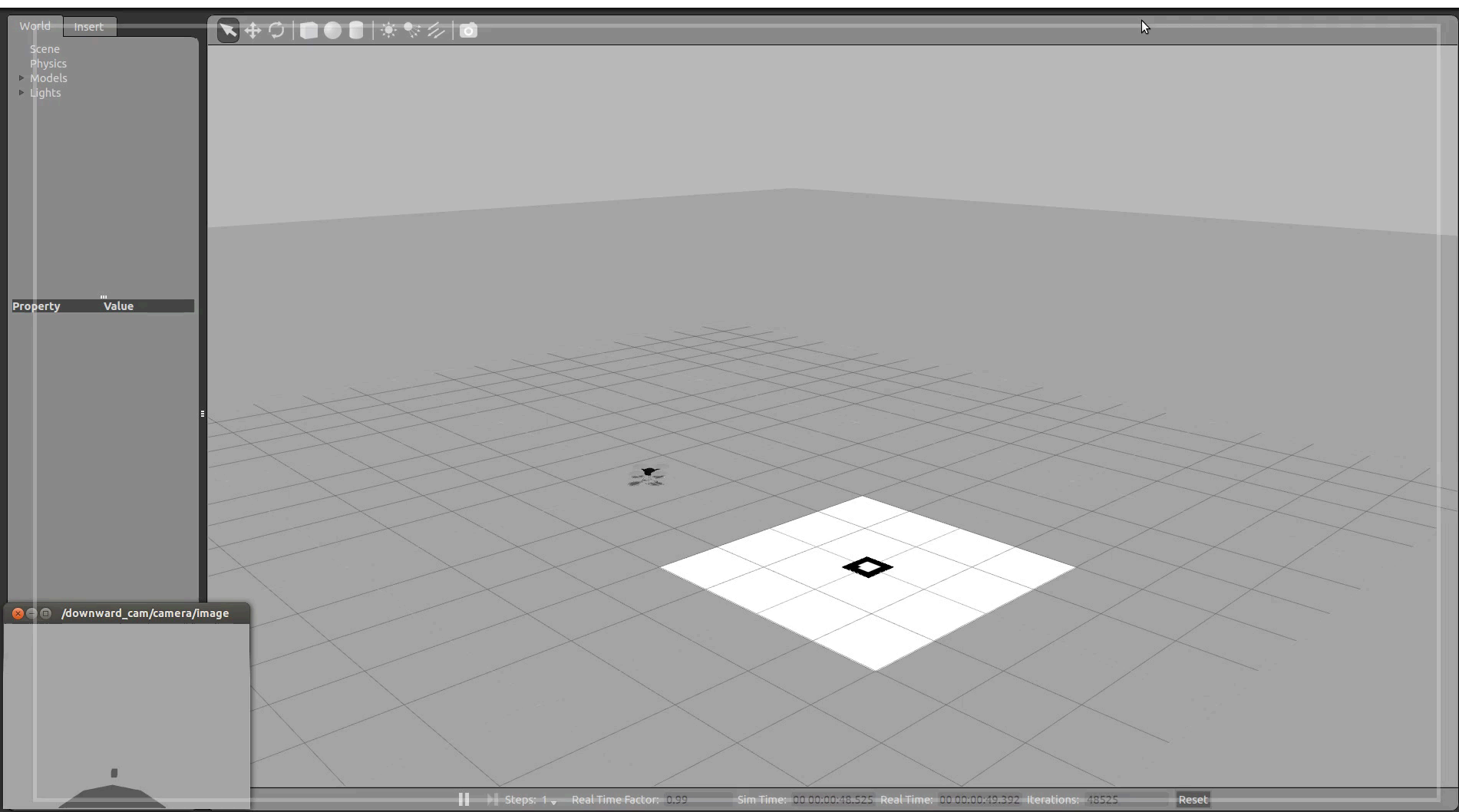


Most commonly computer vision package

Robotics Simulators

- Physical robots have traditionally been expensive and often require careful handling (safety)
- A common way in robotics is therefore to use programs that simulate the physical behaviour of a robot.
- Simulators are useful for initial development, but roboticists always stress their limitations

Example of open source simulator



World Insert

- Scene
- Physics
- Models
 - ▶ ground_plane
 - ▶ spiri
 - ▼ mobile_base
 - base_footprint
 - back_left_wheel
 - back_right_wheel
 - front_left_wheel
 - front_right_wheel
 - joint_back_left_wheel
 - joint_back_right_wheel
 - joint_front_left_wheel
 - joint_front_right_wheel
- ▶ Lights

Property Value

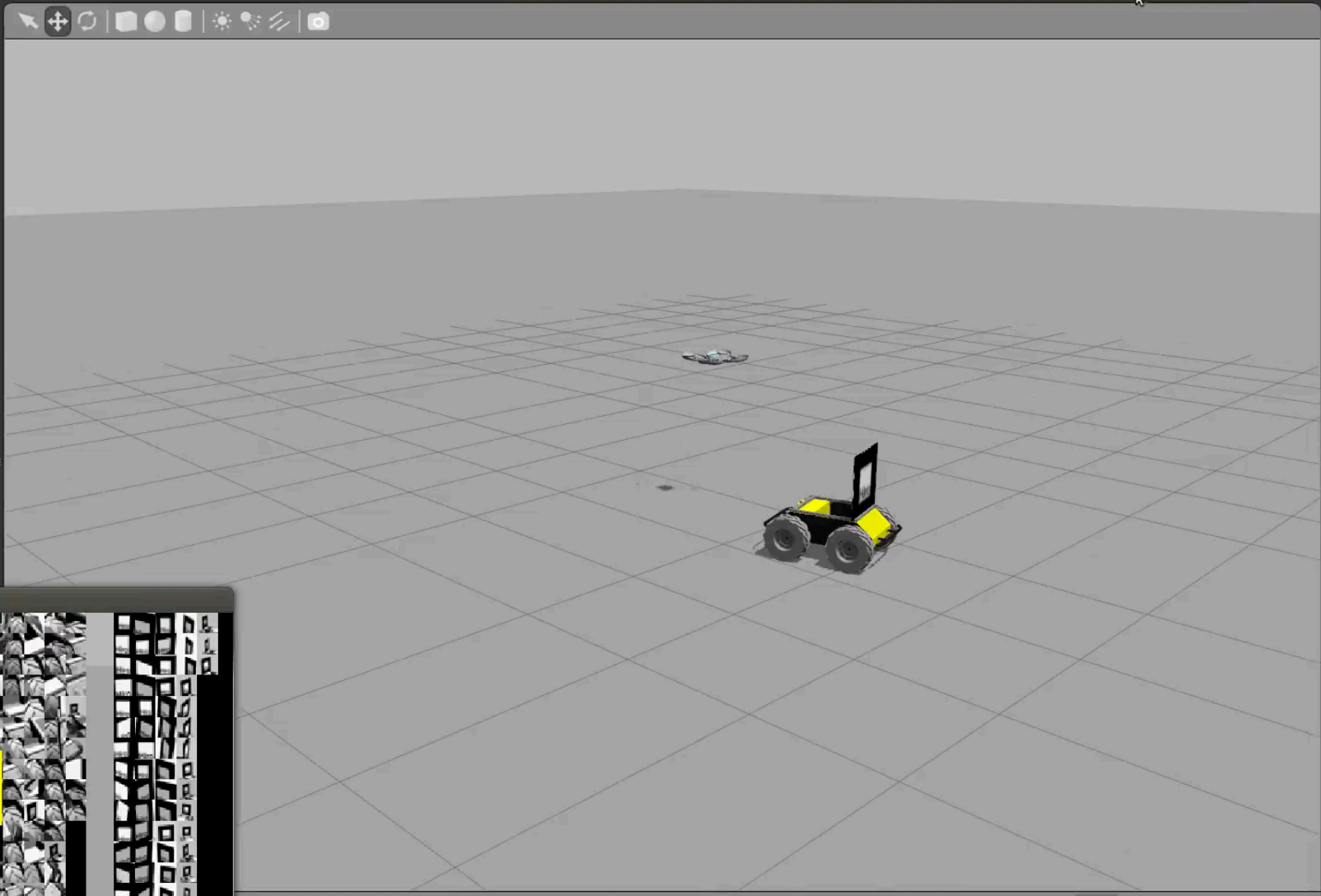
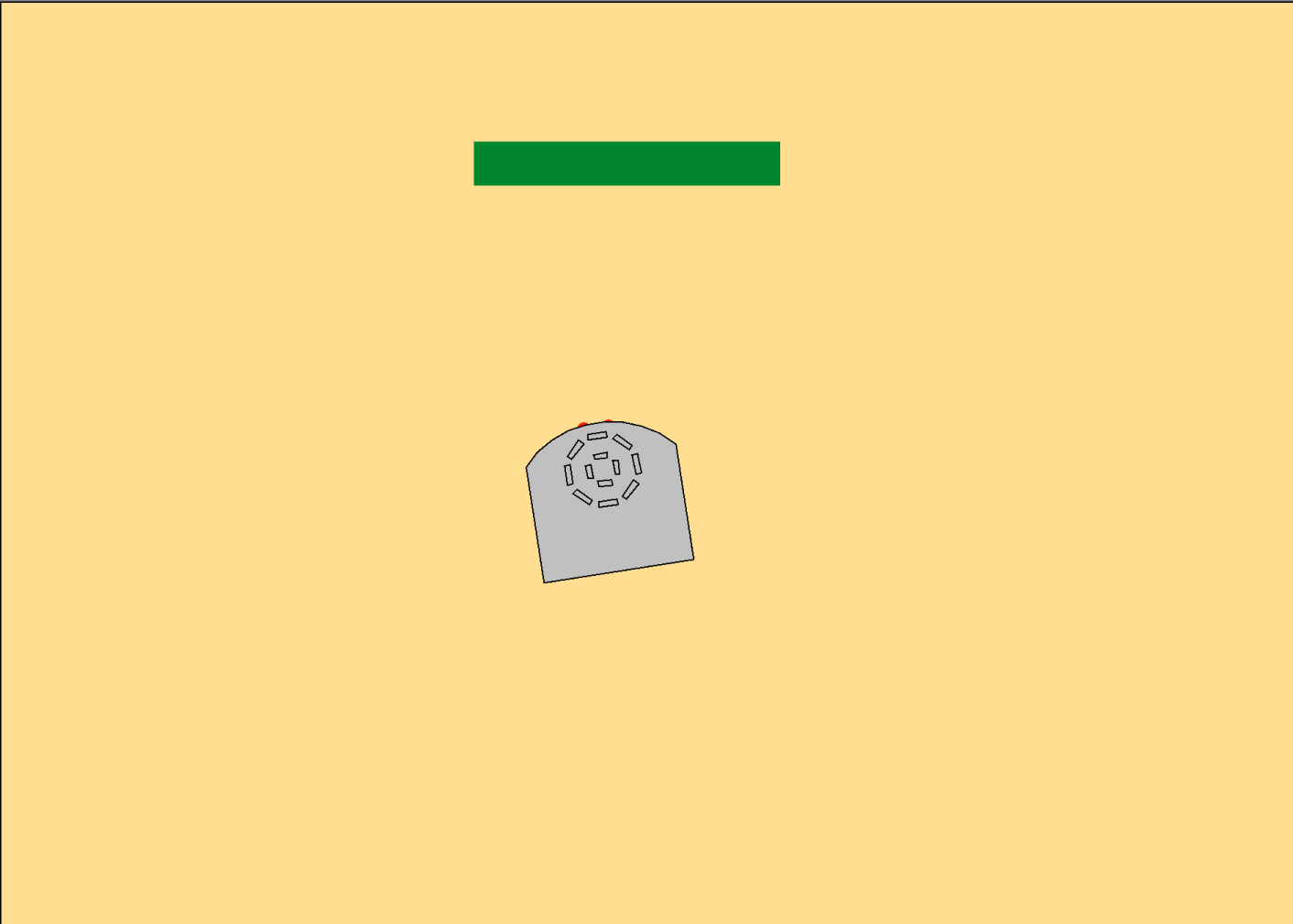


Figure 2





Host: localhost Proxy
ID: 1 Passwd: 0 0
 Status: Not Connected
+ Advanced



Arena: Length 2000 Width 1000
Robot: X 445 Y 616 Dir -9

Updates received: 12800
Updates received: 12900
Updates received: 13000
Updates received: 13100
Updates received: 13200
Updates received: 13300
Updates received: 13400
Updates received: 13500
Updates received: 13600
Updates received: 13700
Updates received: 13800

ThorV2_0 [Running]

DHCPREQUEST on em0 to 255.255.255.255

DI You have the **Auto capture keyboard** option turned on. This will cause the Virtual Machine to automatically **capture** the keyboard. The Virtual Machine reports that the guest OS does not support **mouse pointer integration** in the current video mode.

reordering libraries: done.

s The Virtual Machine reports that the guest OS does not support **mouse pointer integration** in the current video mode.

starting RPC daemons:.

savecore: no core dump

checking quotas: done.

clearing /tmp

kern.securelevel: 0 -> 1

creating runtime link editor directory cache.

preserving editor files.

starting network daemons: smtpd sndiod.

```
*****
*
*                               *
*                               *
*                               *
*****
```

Sun Jan 15 09:51:35 2017 thor[11145]: Log opened

starting local daemons: cron.

Sun Jan 15 09:51:35 AST 2017

OpenBSD/i386 (thor.cs.dal.ca) (ttyC0)

login: _



```
var a = 0
```

```
var i = 3
```

```
for i in 1:3 do
```

```
    a=a+i
```

```
end
```