Lab 7

School of Architecture, Civil and Environmental Engineering

EPFL, SS 2023-2024

http://disal.epfl.ch/teaching/signals_instruments_systems/

What this lab is about

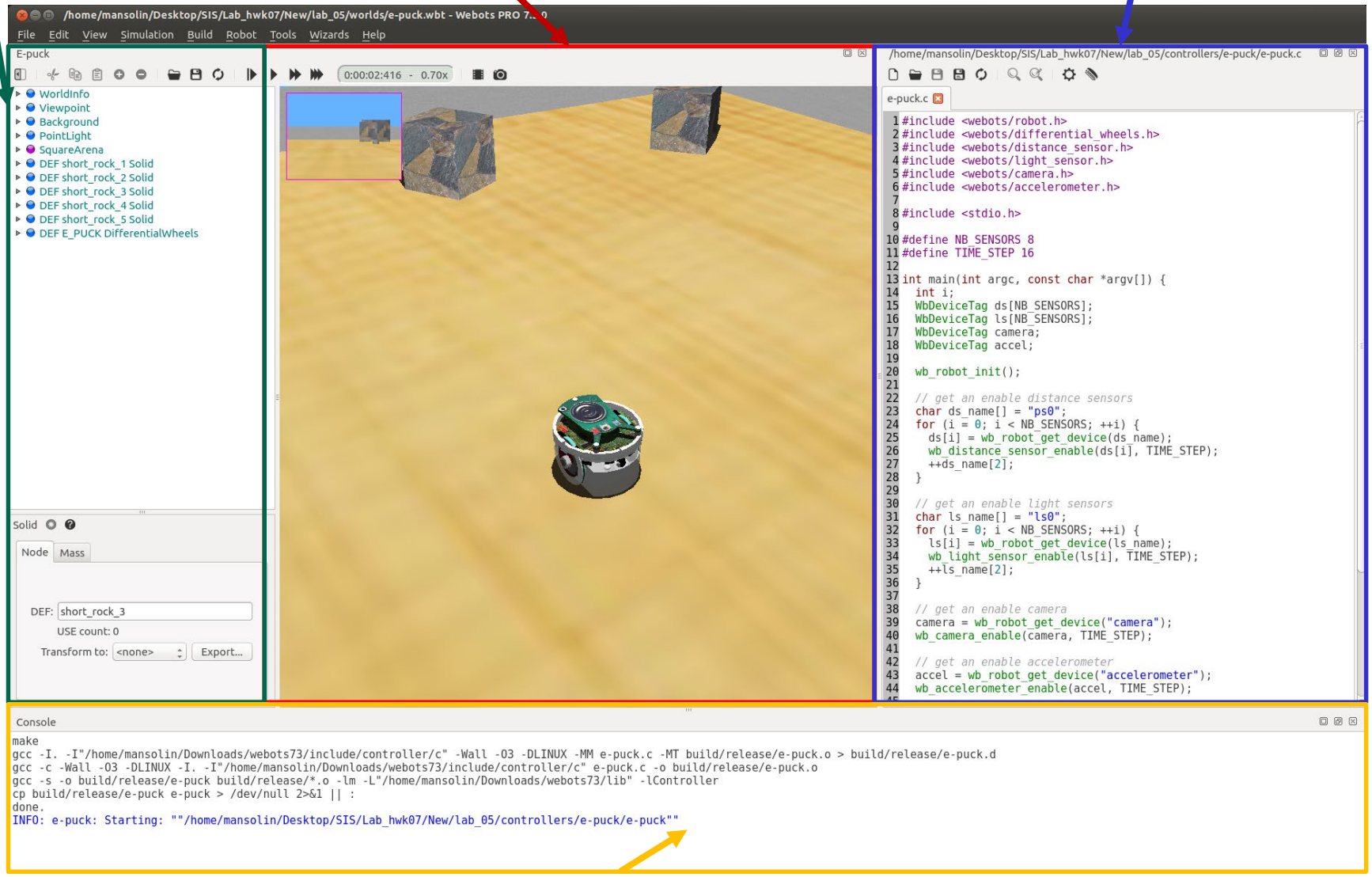
- Mini tutorial on Webots
- Understanding sensors
  - examples of sensors on-board the e-puck
  - notion of ‘noise’
  - how Webots simulates sensors
- Understanding how to use sensor data
  - input for actuation (example: robot control)
  - manipulation of data (logging and plotting)

Reminder: Webots GUI

scene tree

world view

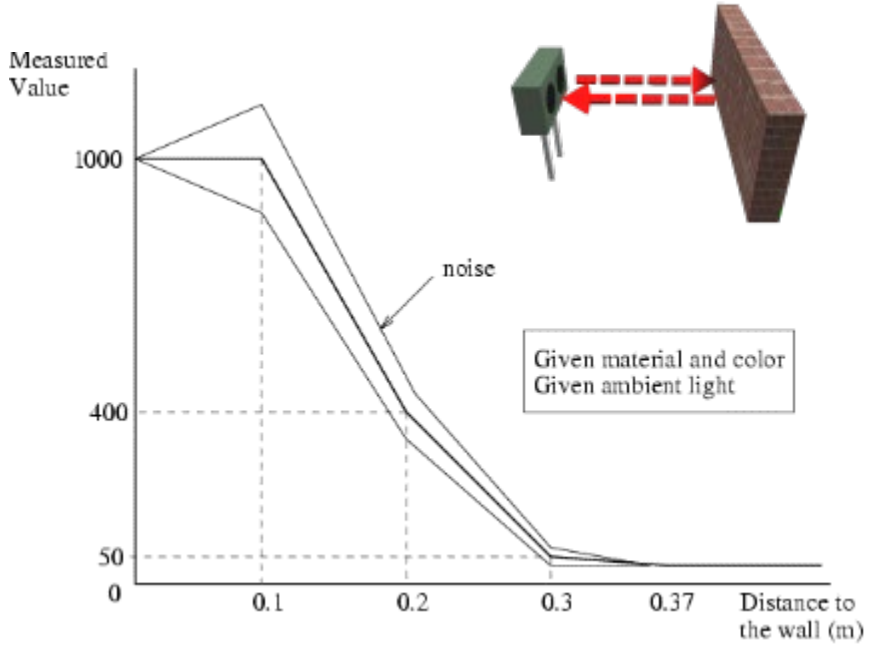
editor



console

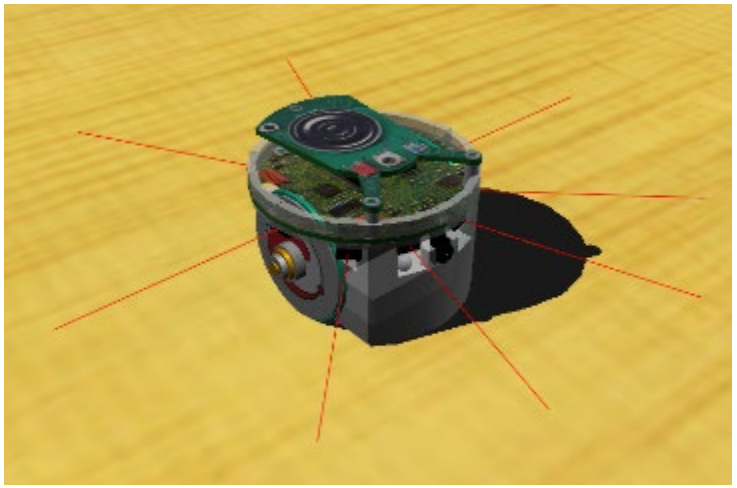
Reminder: Modeling sensors

- Capture **non-linearities** and **noise** of sensors.
- However, **calibration** is often approximative.
- Most often, sensor response is defined by a lookup table (here a proximity sensor):

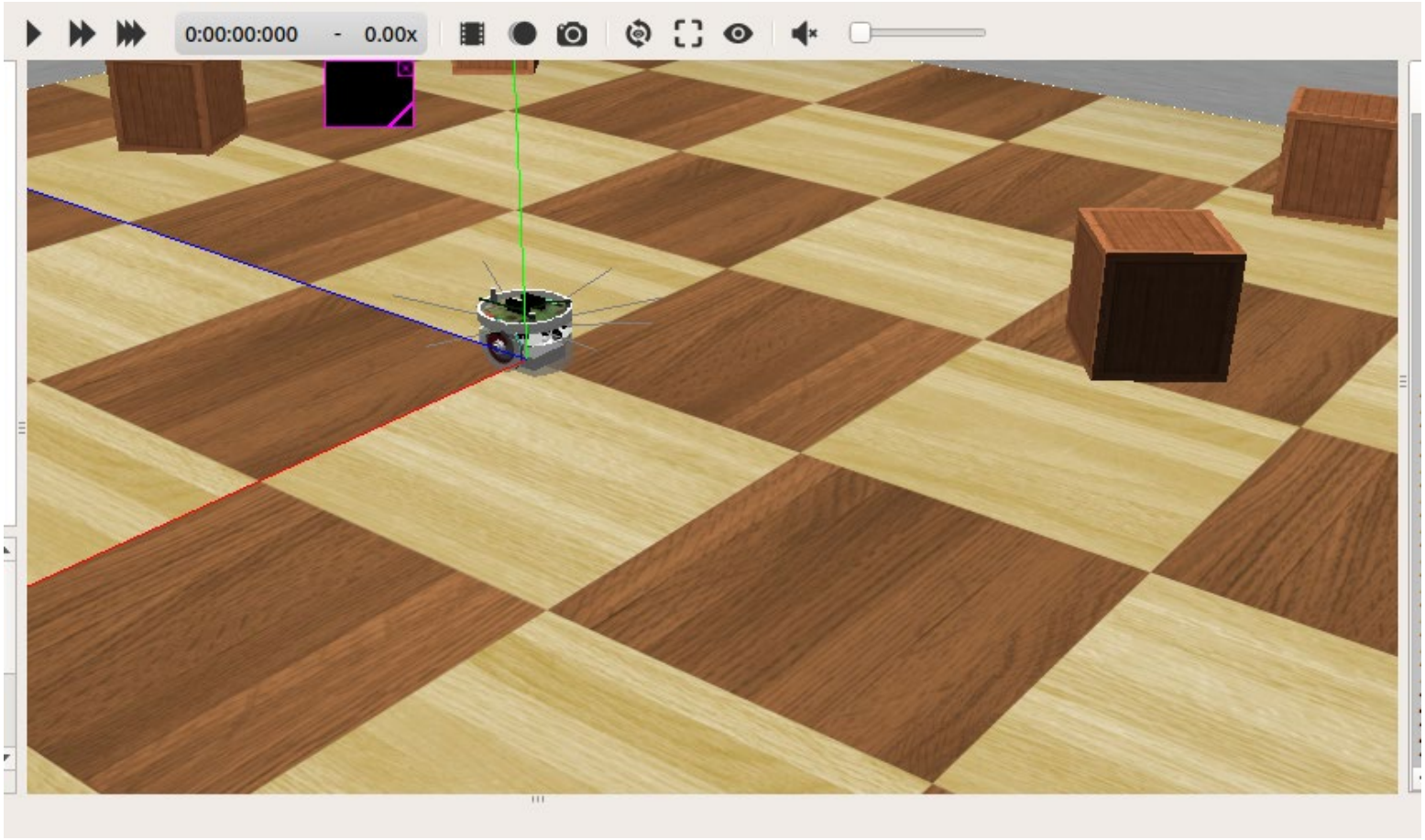



```
lookupTable [ 0       1000   0,
              0.1     1000   0.1,
              0.2      400   0.1,
              0.3       50   0.1,
              0.37      30   0     ]
```

distance value noise



Robot control – Obstacle avoidance



Robot control – Braitenberg