

Soirée Pratique: Build your own robot

Session 5: integration

slides + extra information:

<http://www.ieee-sb-leuven.be/integration2016>

<http://www.ieee-sb-leuven.be/soireepratique>

Schedule sumo robot competition

- First semester: Arduino, sensors, motors, frame

- **Monday 27/2 at 19h30:**
 - integration session: frame + motors + sensors combined

- **Monday 6/3 at 19h30:**
 - building + testing session

- **Monday 20/3 at 19h30:**
 - programming session: the “brains” revisited

- **Monday 27/3 at 19h30:**
 - building + testing session

- (Easter break)

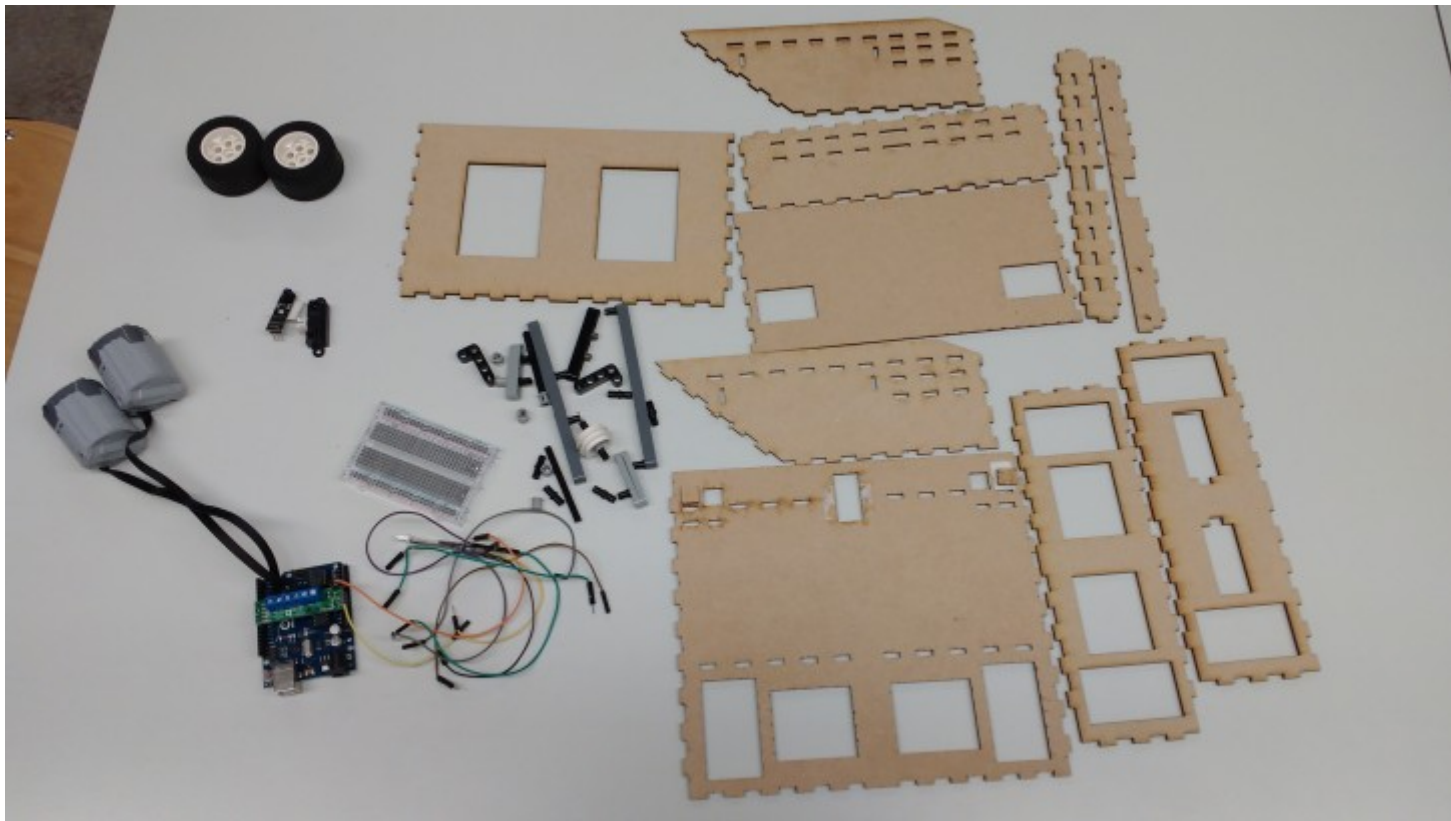
- **Monday 24/4:**
 - final building + testing session

- **Wednesday 26/4: Competition Leuven (Machine room)**

- **(Wednesday 3/5: Competition Gent)**

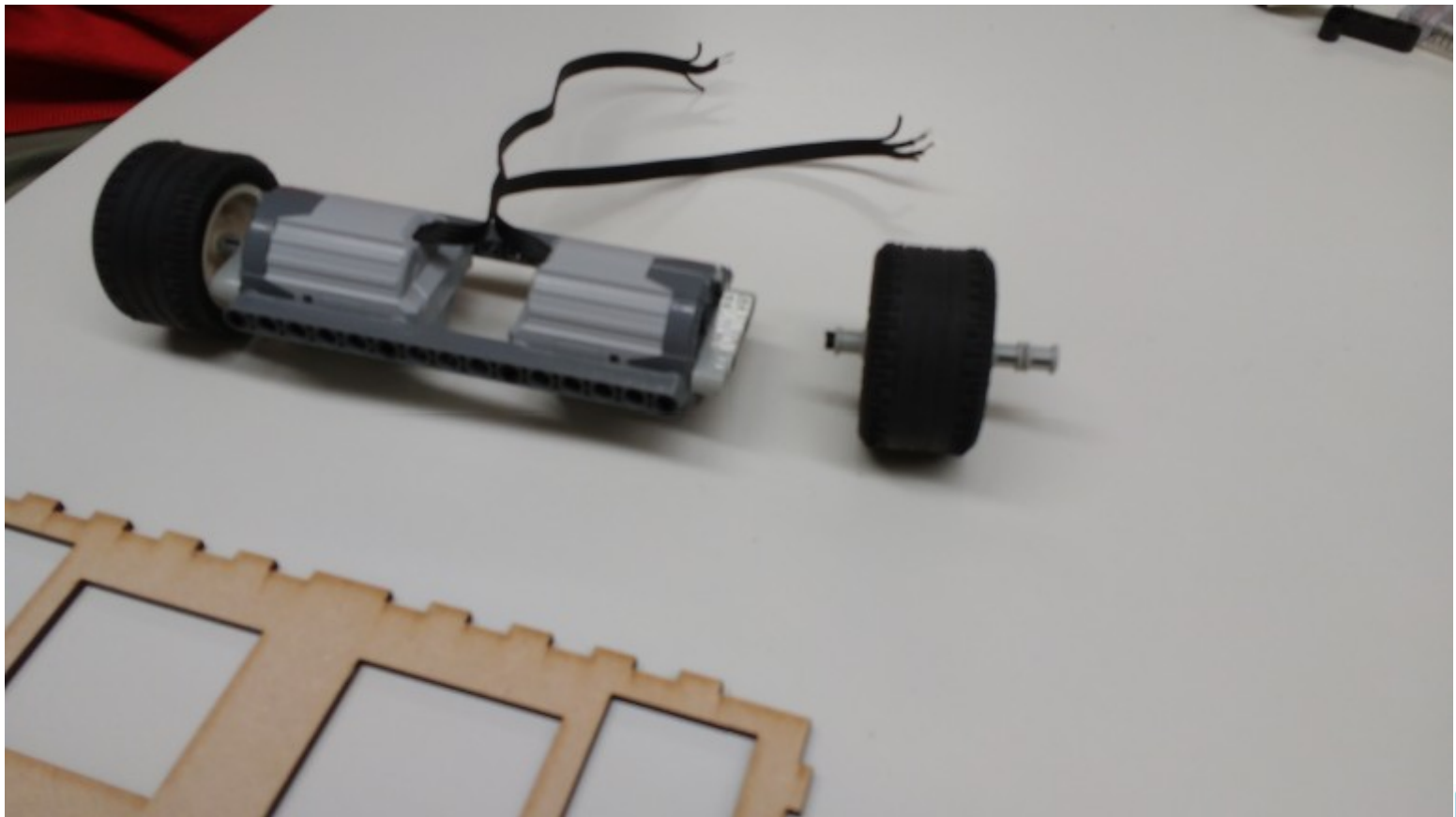
Step-by-step hardware integration

- intended for “design 2” from the “frame session”
- similar process for “design 1” or your own designs



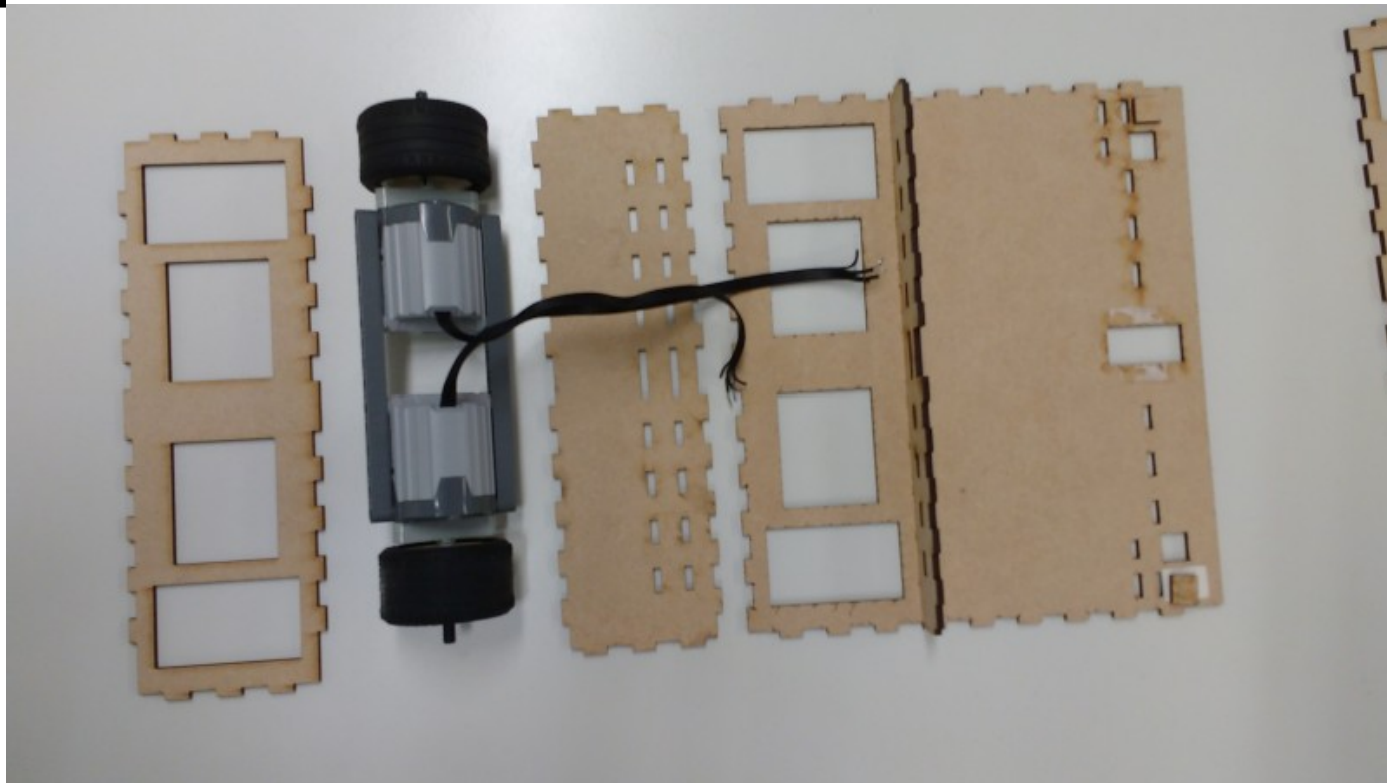
Step-by-step hardware integration

- Step 1: make motor chassis with lego components



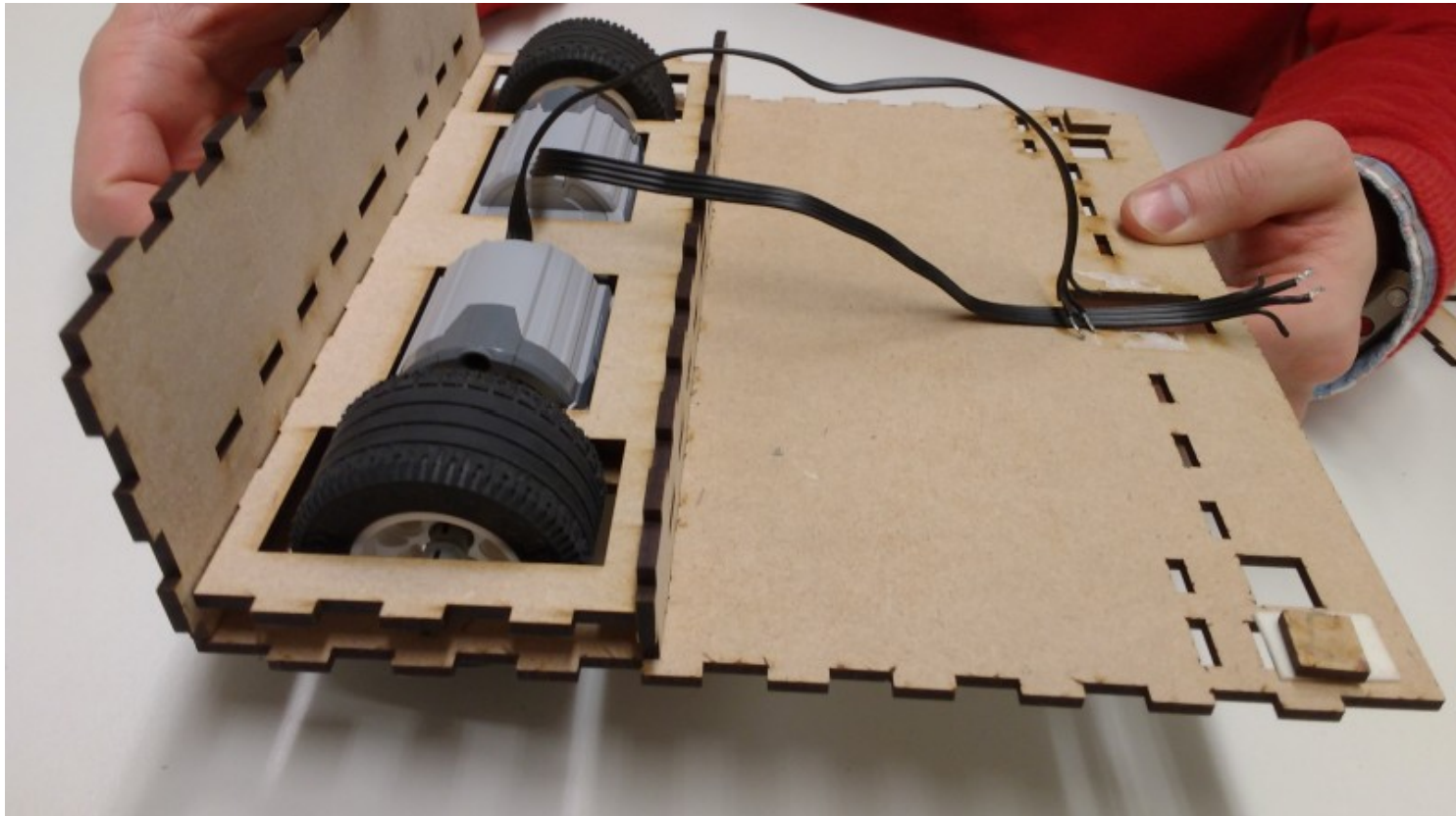
Step-by-step hardware integration

- Step 2: assemble motor into frame, lego bars are hold in place by wooden panels



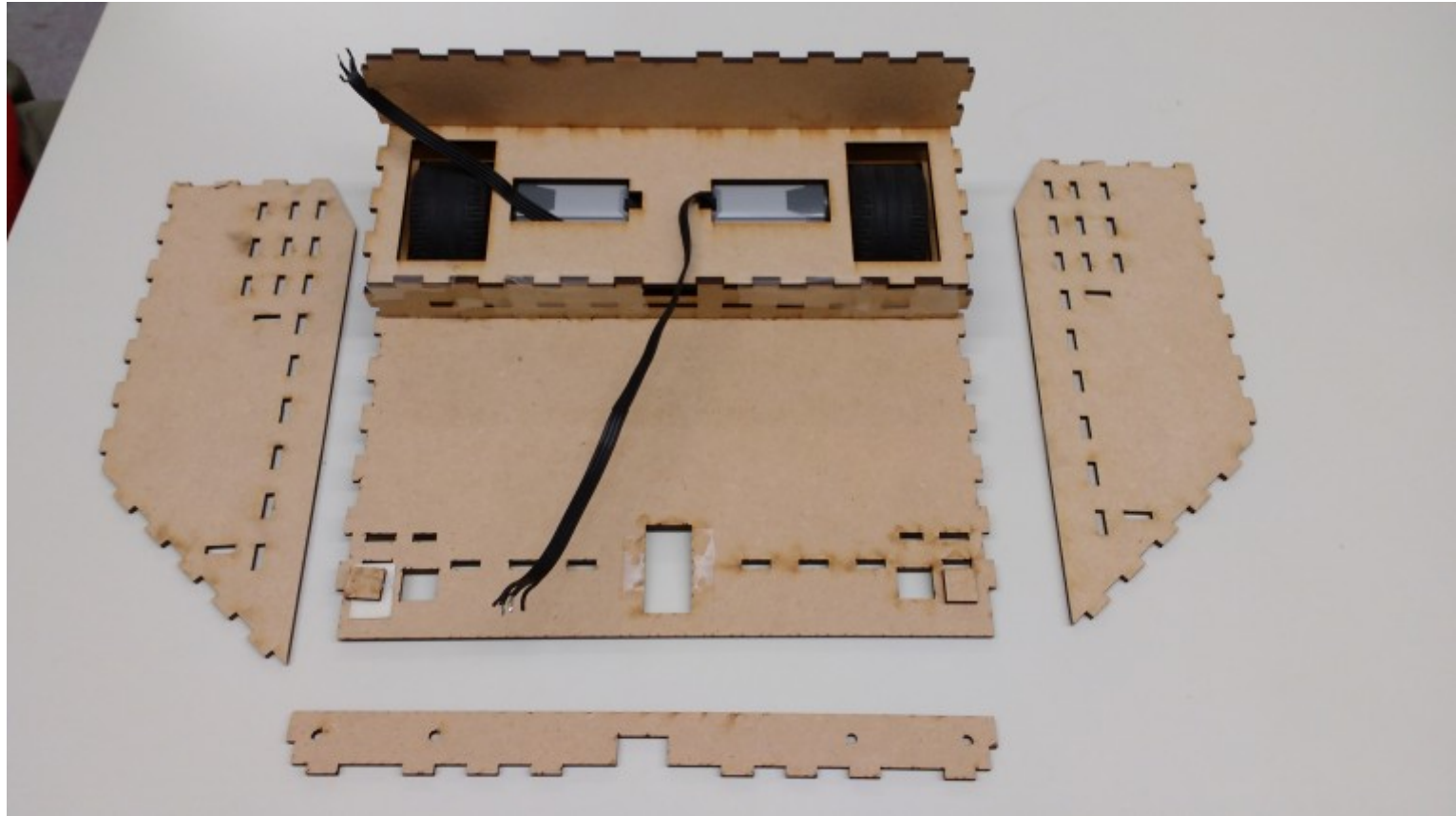
Step-by-step hardware integration

- Step 2: assemble motor into frame (+1 extra panel on wheels not shown)
tip: use tape to hold panels



Step-by-step hardware integration

- Step 3: assemble side panels



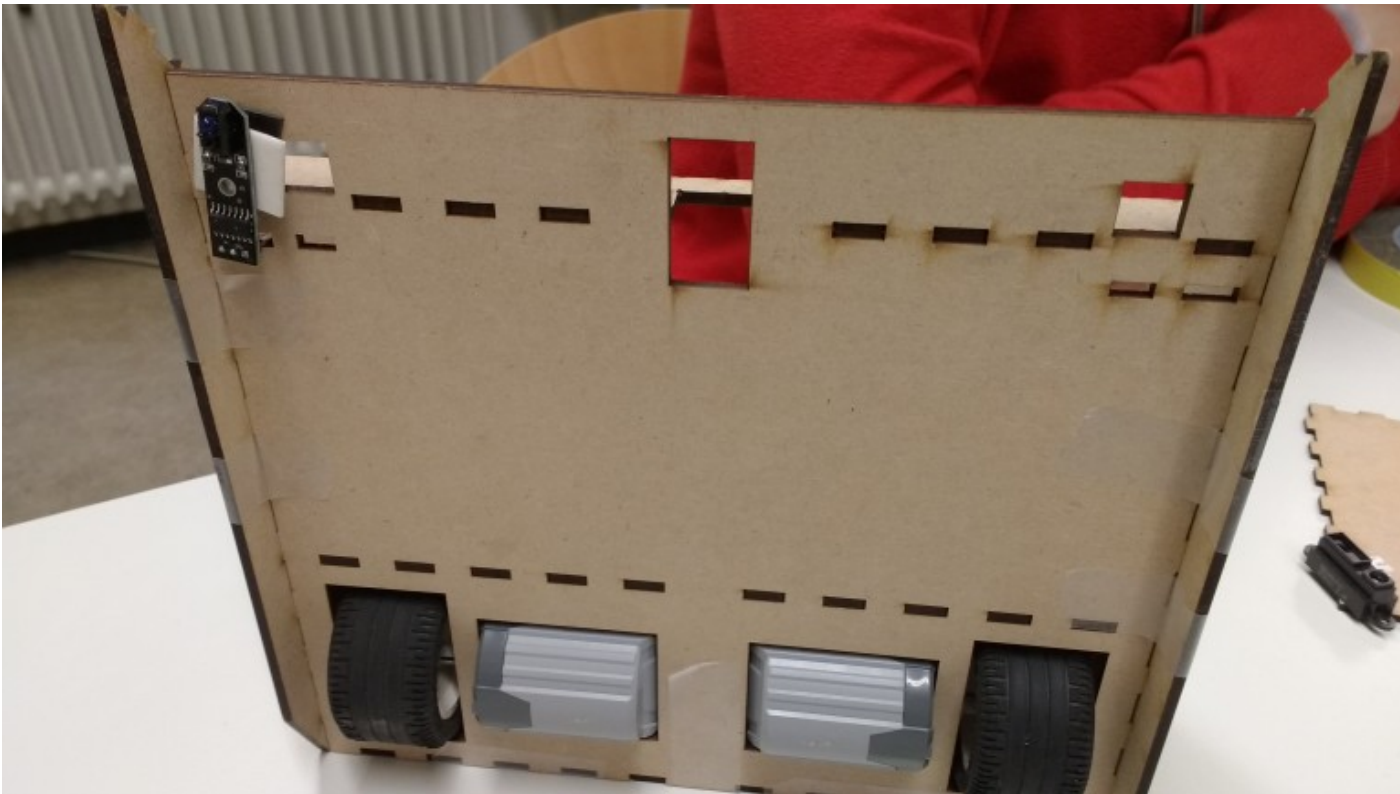
Step-by-step hardware integration

- Step 3: assemble side panels



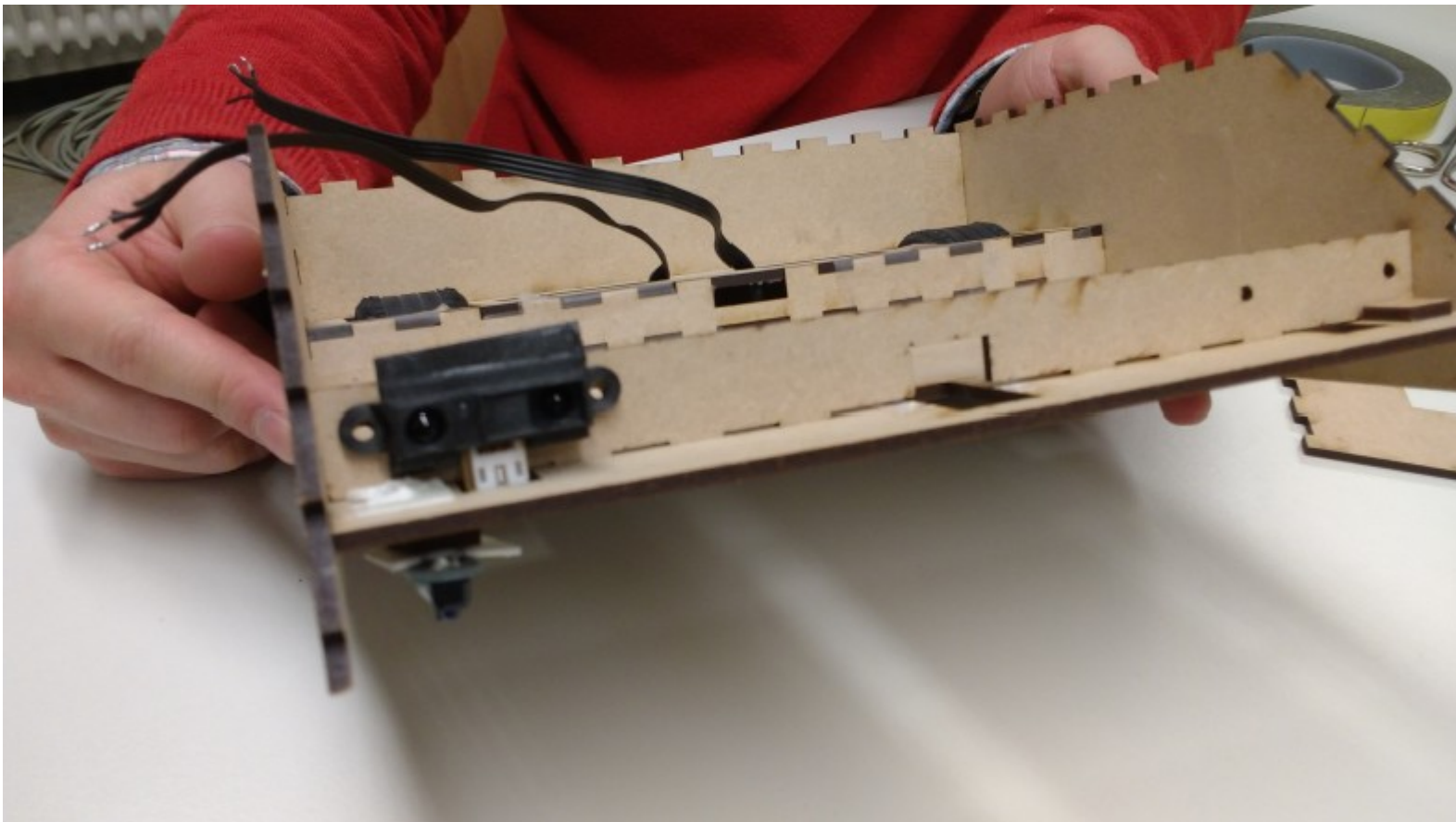
Step-by-step hardware integration

- Step 4: attach optical sensors on bottom with double-sided tape (tip: have a small divider between bottom and sensor)



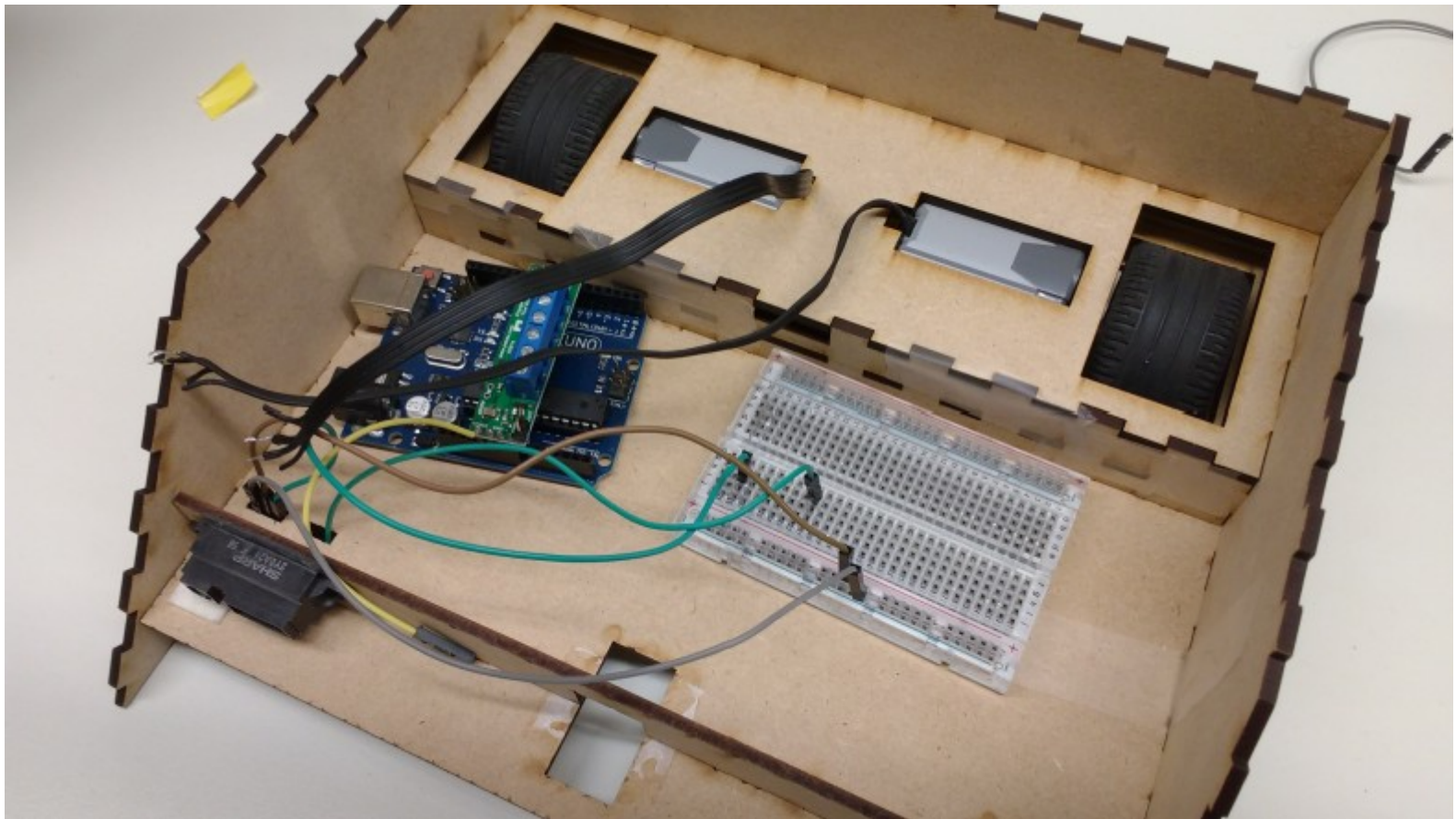
Step-by-step hardware integration

- Step 5: assemble distance sensor with glue, screws or double sided tape



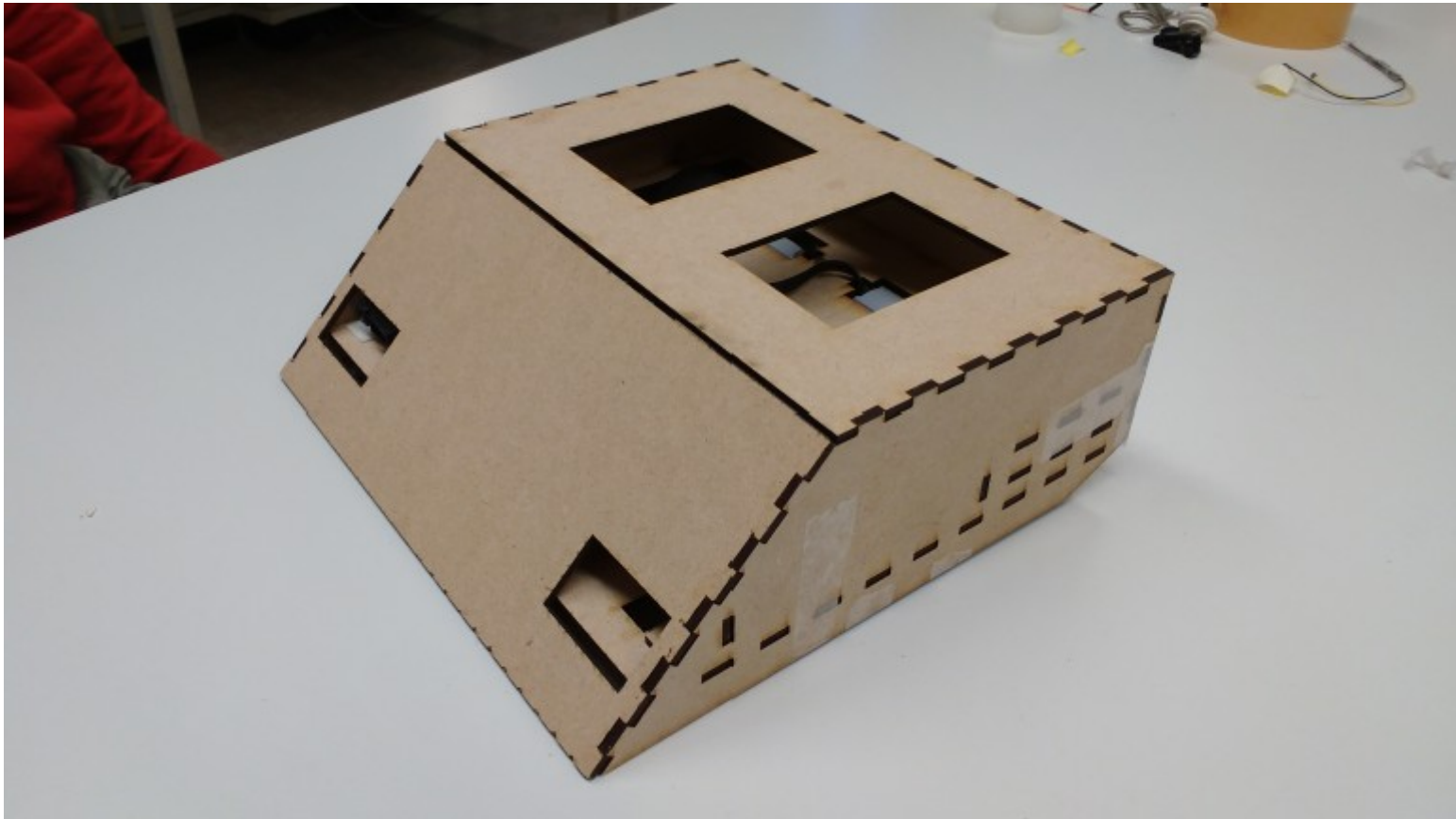
Step-by-step hardware integration

- Step 6: do all the wiring



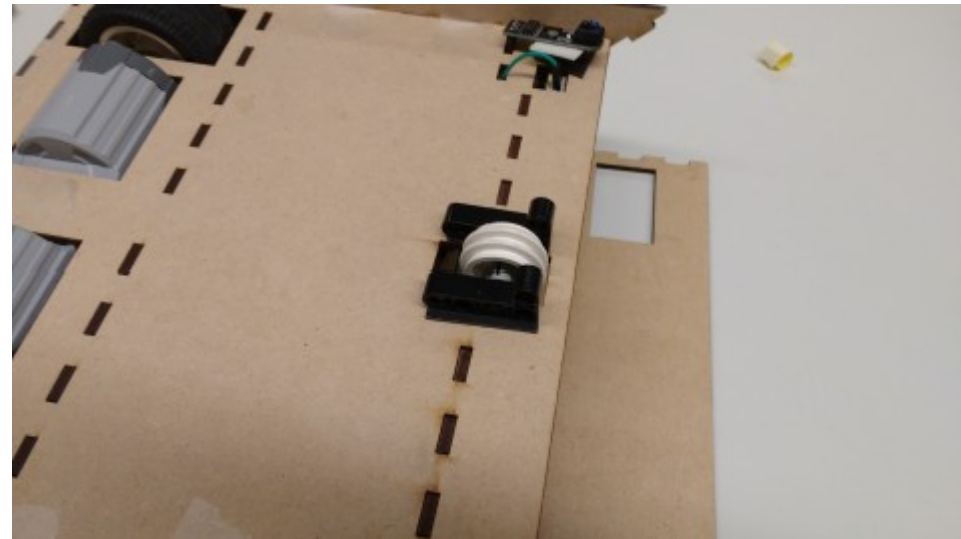
Step-by-step hardware integration

- Step 7: attach remaining plates



Step-by-step hardware integration

- Step 8: attach small wheel in front



Software integration

- Combine **example code** from “motor session” and “sensor session”
- Try making following applications (frame not needed yet):
 1. Drive **motor forward** at constant speed. When optical sensor **detects white**, then drive **motor backward**
 2. Drive **motor forward** at **low speed**. When **distance sensor detects a target** close by (measurement < threshold), then drive **motor forward** at **high speed**
- In two sessions we will cover **advanced robot control methods** on arduino with code template

Next Soirée Pratique

- next session Monday 6/3 :
 - building session + training session: no new information, just building the robot
 - probably fablab is also open (will check)

■ Questions:

Another FabLab session for us alone?

Would you like new tools / components to be ordered?

See you all the next session!