

Part files for 3D printing:

- The “STL files” folder contains all needed parts in the STL file format (except the parametric joint, see below)
- You have been given most parts that you will need but if your evolved robot contains a parametric joint or IR sensors then you will need to print the corresponding parts
- All files are open source and can also be found on the RoboGen GitHub page:
https://github.com/lis-epfl/robogen/tree/master/printing-3D/STL_Files_For_FDM

Parametric joint parameter configuration and 3D printing:

1. Download SCAD for your PC from <https://openscad.org/downloads.html>
2. Open “ParametricPartATemplate.scad”. On line 4, set the length in partA(length, angle) to the required value. Leave the angle as zero. Save this part as “ParametricPartATemplate.stl”.
3. Open “ParametricPartBTemplate.scad”. On line 4, set the angle in partB(angle) to the required value. Save this part as “ParametricPartBTemplate.stl”.
4. You can now open the STL files in PrusaSlicer (we’ll be using Prusa MK3s), set the desired print parameters with the help of the TAs and DLL staff, and print your parts.

IR sensor wiring and testing

1. Follow the instructions on the “RoboGen Project” YouTube channel for wiring you IR sensors:
<https://www.youtube.com/watch?v=e-OxctM4te0>
2. Download the Arduino IDE from <https://www.arduino.cc/en/software>
3. Open the “IRSensorsfinal4sensors.ino” in the Arduino IDE (found in the “IRSensorTesting” folder).
4. As documented in the video, connect the NanoWii via USB, make sure the correct board (Arduino Leonardo) and port are selected under the “tools” tab, upload the code, and open the Serial Monitor in the Arduino IDE.
5. Move your hand towards and away from your sensor to see the distance measurement in the column corresponding to the analog pin you connected the IR sensor to.
6. You will also need to 3D print the housing for the IR sensor using the provided STL file. IrSensor.stl is provided in the zip folder on moodle which is a single part that can be printed. A two part IR sensor housing can also be found on the RoboGen GitHub.

Servo motor connections:

- See the “RoboGen Robot Assembly” video for instructions on connecting the servos to the NanoWii board: <https://www.youtube.com/watch?v=V0oJnpRoF0w>
- The NanoWii board that you have been given can support 8 servo motors
- There are six GND-RAW-DIGITAL port combinations where you can connect the three adjacent servo wires
- The final 2 servos will be powered from the SJ2 pin (see the “NanoWii_Manual.pdf”)
- The servos must be connected to the correct digital pins for the neural network control to work. Compare the joint names in your robot description file and with the joint names in the “NeuralNetwork.h” file that you download from RoboGen to see which pins each servo should be connected to (see video)
- NOTE: for connecting extension wires, please do not solder the extensions onto the existing servo wires (i.e. do not cut the connectors off the servo wires). Instead, attach female connectors onto the extension wires and insert into the male connectors on the servos.