

Hexapod Brief

The aim of this mini-project is to further investigate the Hexapod neural-circuit robot in Webots. Here are some suggestions.

Investigating gait transitions

The code provided selects either the tripod, tetrapod, or metachronal gait using a fixed controller argument. Can we make the Hexapod change gait in real time as it is walking?

- Change the code so the key parameter changes over time
 - How to do this?
 - How quickly to do this?
 - Observations
 - Does it work – were you successful? If not suggest why.
 - Did you discover any new gaits?
 - Measure the speed of the Hexapod and plot this against the key parameter
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Changing the model parameters

The neural circuit has tons of parameters. You can change these, but you must maintain the correct phase differences to make the Hexapod walk

- Identify which parameters are available for change
 - Change these (one at a time) and see if they change *any* gait
 - Measure the speed of the Hexapod as a function of your changed parameter
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Getting the Hexapod to move along an arc

- Investigate changes to the model (while keeping within the spirit of neural circuits)
 - Change the parameters of selected neurons
 - Add additional neural circuitry
 - Measure the radius of the arc
 - Work out a way of doing this
 - Plot the radius as a function of the parameter you choose.
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Adding and Using sensors to get the robot to avoid obstacles

- This is challenging. An approach could be
 - Look at the sensors in other robots like ePuck or BoeBot
 - These will be found in the PROTO scripr
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