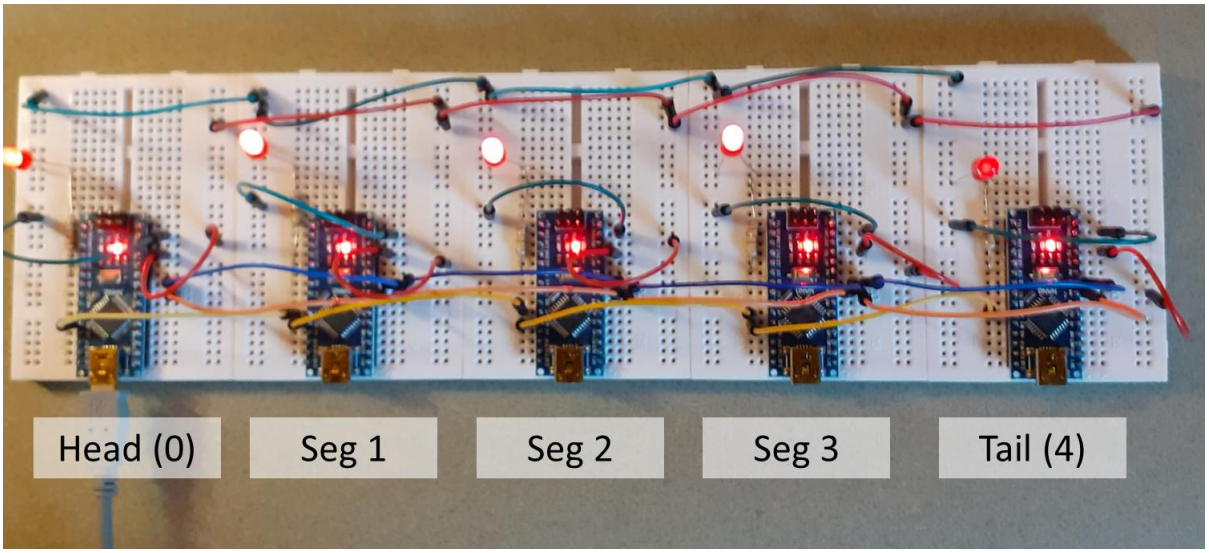
Arduino Systolic Array Brief

The aim of this mini-project is to explore various scenarios running on an Arduino systolic array. You will be given the device shown below, where the wiring is (mostly) complete.



Sketch Myriapod_RK_1

Setting up

- In the sketch activate the line **segType = HEAD;** insert the USB cable into the Head and upload
- Now deactivate the above and activate **segType = SEGM** and for the segment set **this_node_ID = 1**. Plug the USB into Seg 1 and upload.
- Repeat for Seg 2 and Seg 3, remembering to set the correct **this_node_ID**
- Now activate and upload the tail code.
- Put the USB into the Head
- Press Arduino Reset working from tail to head

You should see a 'wave' passing down the LEDs

A few checks

- The phaseLag is set to 60 degs. At which PE will it be 180 degs? How should the behaviour of the LED on this segment relate to the Head LED?
- Calculate the phase lag needed so that the Tail LED is 180 degs out of phase with the Head?
- Activate **segType = HEAD** and change the value of phaseLag to your calculations. Check you were right.

Investigations

The baseline values for the parameters are

omega	2*PI
phaseLag	60 (degrees)
alpha	5
mu	1

Make sure these variables are set. Now investigate the effects of changing omega, then alpha then mu?

What to observe? The brightness of the LEDs. Look for time for changes. See if you can see any waves passing down the array.

Sketch

Coming soon

Your own ideas

Think of a series of computations which could be usefully done on this systolic array. Then ask for some help on how to modify the code.
