### Project 1 (View based navigation)

In this project the JRA will investigate what type of visual systems are good for insect-inspired robot navigation. Using our industrial gantry robot, the student will use existing models of insect visual systems and test their usefulness for view based navigation. Students will not have to do lots of programming, but should be confident at thinking algorithmically and mathematically. Students should also be systematic and organised for the practical components of the work.

Mentors: Paul Graham and Alex Dewar

ALGORITHMIC

### Project 4 (Insect-inspired navigation on tracked robots)

For this project, the JRA will investigate how best to implement insect-inspired algorithms for vision-based homing on a small tracked robot. Using our knowledge about the structure of visual receptive fields in *Drosophila* the JRA will attempt to uncover the simple computational strategies that could underlie visually guided navigation in insects. A candidate should ideally have either some experience with programming or mathematics.

Mentors: Alex Dewar and Andy Philippides

PROGRAMMING

### Project 3 (GPU accelerated computing and robotics)

In this project the JRA will investigate how to simulate a bee brain model on a mobile GPU accelerated device (NVIDIA Jetson) and will perform some experiments with this simulation on a wheeled robot. The goal would be to demonstrate a proof of concept for brain-inspired operation of the wheeled robot in a simple paradigm, such as light following. A successful candidate would need to have strong programming skills.

Mentors: Jamie Knight, Thomas Nowotny and James Turner

Intro

Motivations

How can this project help

Similar projects include

How they didn’t solve the problem

What my project will be.

Research questions

What I am going to implement