

AMOTH

Chemotactic Search in Complex Environments

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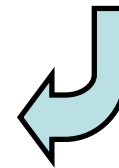
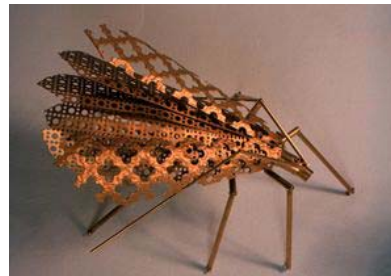
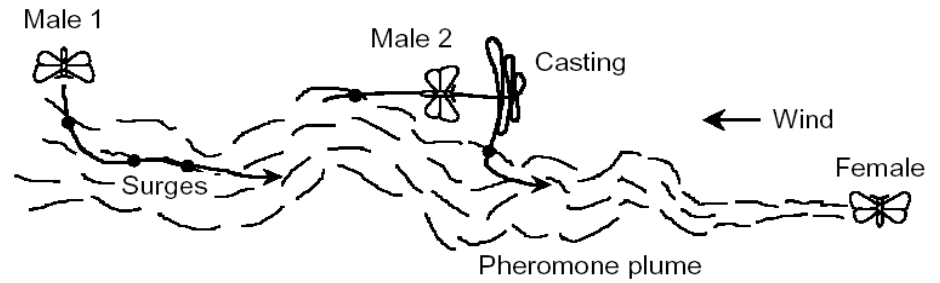
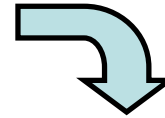
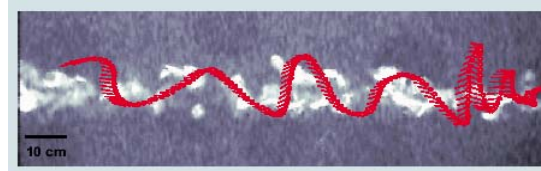
Ms. Jing Gu, ULEIC

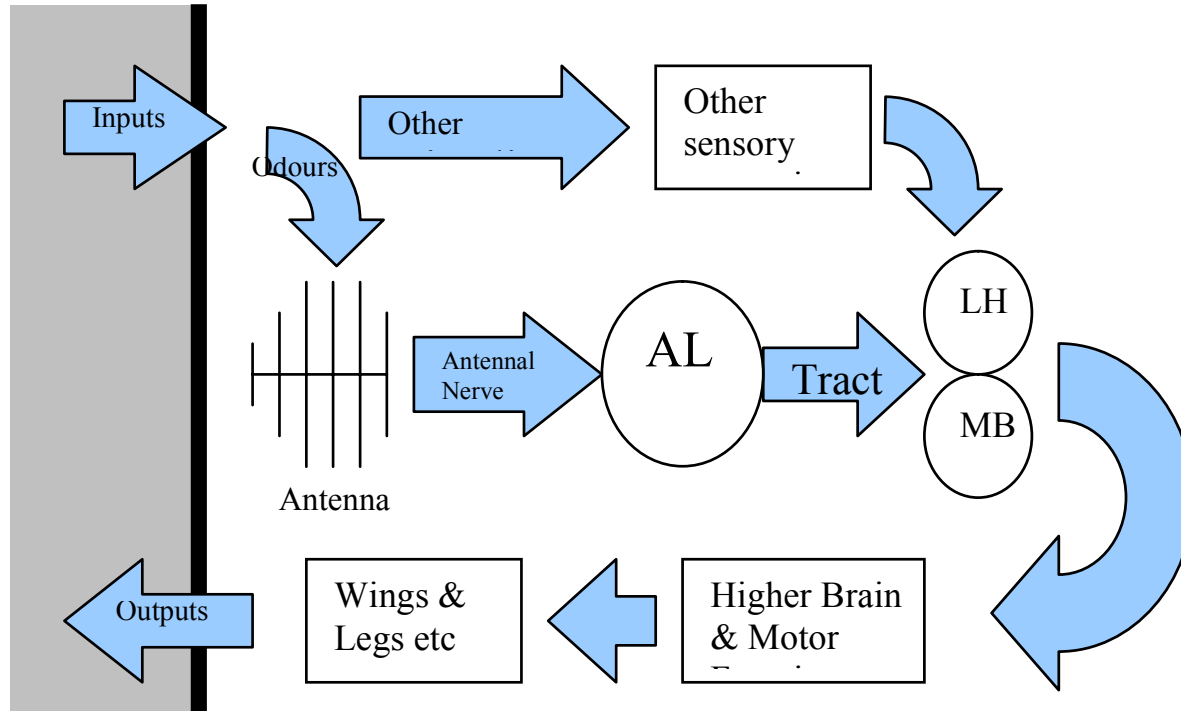
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- We will develop a chemosensory UAV (unmanned ariel vehicle) that uses onboard chemical and visual sensors to autonomously navigate outdoors. The cUAVSs mission is to identify volatile compounds and locate their sources
- We will map the chemical composition of the environment using a new class of chemical sensors and processing technologies designed for
 - Measurement of chemical concentration
 - Classification of chemical composition
 - Automatic sensor recalibration
- Implement mechanisms and models of adaptive sensory classification, sensory-motor integration and action selection. These technologies are based on our investigation of insect strategies of sensory processing and control and their application in robotics
- Deploy a fleet of cUAVs to collectively solve the task of mapping a realistic chemosensory environment

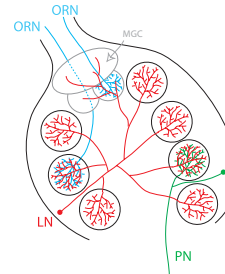




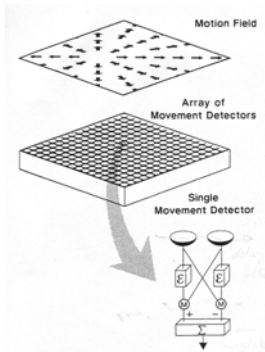
Overall system context of the pheromone detection system in moths (shown in centre). AL is the antennal lobe, MB the mushroom bodies and, LH the lateral horn. This schematic shows the animal in an "input/output" diagram with respect to its environment.



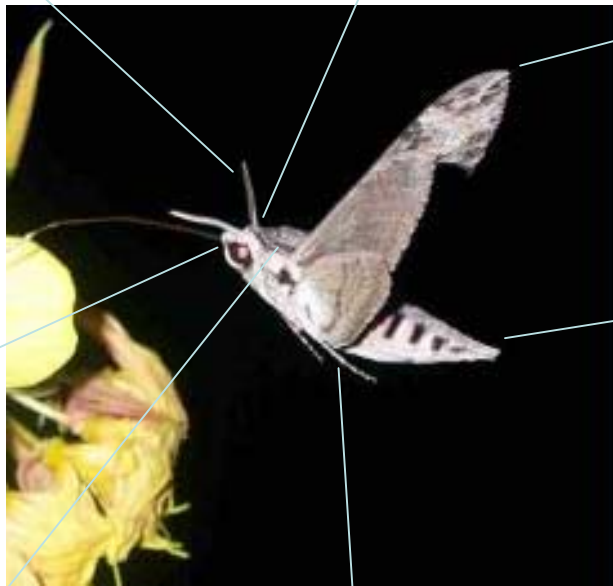
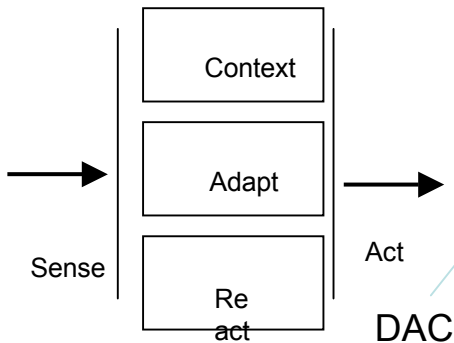
chemical sensor array



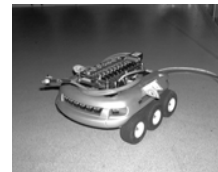
Antennal lobe model



vision/motion detection



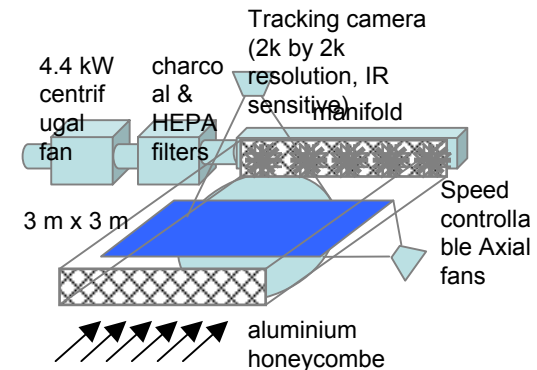
roving robot



uav



pheromone plume



3 m x 3 m