

PhD Opportunities in Animal Communication

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Many animals use movement to communicate, yet the factors that contribute to signal design have not been considered in detail. We speculate that animals are constrained by the sensory system of receivers, morphological limitations of signallers, the signalling environment and potential eavesdroppers (predators). Our goal is to understand how such factors interact to influence movement-based signalling strategies. **We are seeking 2 PhD students** to undertake research on movement-based signalling by Agamid lizards.

Project 1 - Evolutionary simulations: The project will be based around a novel strategy that we are developing, which combines tools from evolutionary robotics and behavioural ecology to address movement-based signal evolution. Briefly, the strategy uses live animals as selective agents to optimise the fine structure of a motion signal in an artificial evolution environment controlled by a standard genetic algorithm. By manipulating the environmental conditions in which this evolution takes place, we can systematically explore what makes a signal effective from the perspective of a receiver under close to natural conditions.



Project 2 - Lizards in a virtual world: Identifying how animal signals are optimized through evolution is reliant on strategies that allow us to quantify signals (and noise) in a meaningful way. Signals defined by movement can be quantified from image sequences, but these are restricted to a single camera view and doesn't fully capture the signal. The problem is exacerbated when signals have a complex three-dimensional (3D) trajectory. The project will commence by implementing a new strategy to address these constraints involving motion capture of real displays, construction of lizard animations and virtual microhabitats and scene analysis. In subsequent years, predictions from a virtual world can then be tested on live animals in the field.

Students would be based in the Peters Lab in the Department of Zoology at La Trobe University's Melbourne campus (Bundoora, Victoria), although there will be opportunities to spend time in the Hemmi lab at The Australian National University.

For more information: Please visit the Peters Lab online for more information. Select the 'Opportunities' link for details and links to application forms and scholarship information:

<http://richard.eriophora.com.au>

Expressions of interest should be sent to Richard at richard.peters@latrobe.edu.au

Scholarships: La Trobe University offers scholarships to local and international PhD students. Please visit the Peters Lab for details. Closing date for 2011 applications:

Australian citizens/residents: October 31, 2010

International applicants: September 30, 2010