**NEXUSS CDT Research Experience Placement 2019**

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| Lead Supervisor:  | Dr Judith Lock |
| Email:  | J.E.Lock@soton.ac.uk |
| University/Research Organisation:  | University of Southampton |
| Department:  | School of Biological Sciences |
| Project Title:  | **Developing ecological monitoring devices using Raspberry Pi technology**  |
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| Total Student Support Costs: £ | ***Students will receive an hourly pay of £8.44 per hour. You will be required to work for 30 hours a week over an 8 week period.*** |
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| Proposed Start Date: **Thursday, 1st August 2019** | Proposed End Date: **Wednesday, 25 September 2019**  |
| *Projects should run over the summer vacation and we recommend that projects will have terminated by 25 September 2019.* |
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| **Brief Summary – please provide a brief summary (maximum 300 words) of the project.***This should include:** *Project outline;*
* *Links to staff/School/Centre activity as appropriate;*
* *Supervisory arrangement;*
* *How space/equipment/supporting resource demands will be met;*
* *Elements of the project that will incorporate elements other than computer/modelling e.g. fieldwork and data collection;*
* *How the project will enhance the skills of the appointed student;*
* *Any intellectual property rights concerns that may arise from the work.*

 The sand lizard *Lacerta agilis* is a European Protected Species and suffered wide-scale decline in the UK in the twentieth century. A programme for reintroduction was set up in the 1970s to return the species to areas of restored habitat. Many unknowns still exist around the ecology of the sand lizard due to its highly cryptic nature, making it difficult to quantify the level of success of reintroduced populations. This project is part of a wider PhD project (Rachel Gardher) which is a collaboration between Biological Sciences (Judith Lock) and Marwell Wildlife (Philip Riordan), which has a captive population of breeding sand lizards. The project aims to assess dispersal and survivorship of sand lizards following release, examining effects of individual differences and interspecific interactions with other reptiles, following release into the wild. In summer 2017 we had a NEXUSS intern, Shivank Sharma, working with us on this project. His involvement corresponded with a general shift by ecologists, as to the value and application of raspberry-pi technology for remote field data collection (as seen in a PLOS One article published in October 2017 <https://doi.org/10.1371/journal.pone.0185026>). The British Ecological Society’s annual meeting in December 2018 included a workshop on the use of raspberry-pi technology, which my PhD student, Rachel Gardner, attended. Overall there is growing realisation of the great potential that this technology offers, but also the lack of knowledge in the use of technology by ecologists.The NEXUSS internship therefore provides the perfect opportunity for a student with experience and knowledge of raspberry pi technology to apply this knowledge working with a conservation organisation, to assist in the development of remote sensor cameras that are appropriate for data collection of cold-blooded animals, such as sand lizards (most camera traps have heat sensors to detect warm-blooded animals, such as mammals). In addition, production of an open-source manual, with an accompanying publication, would be of interest to many field ecologists. |
| **Please give an indicative timescale for the student’s work over the length of the project: (maximum 150 words).***This should include:** *The broad tasks the student will undertake;*
* *An indicative timescale for these tasks.*

The student will mainly be based at Marwell zoo, in the Science & Learning Centre and working on the captive population of sand lizards that are housed in a vivarium that is not open to viewing by members of the public. Week 1 = briefing from sand lizard team, induction at MarwellWeeks 1 and 2 = reading of relevant literature, including open source code for raspberry pi camera trapsWeeks 3 and 4 = working with raspberry pi cameras produced by previous intern, to collect pilot dataWeeks 5 to 8 = testing and refinement of technology in sand lizard enclosureWeeks 4 to 8 = development of a users’ manual for ecologists |
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| **Proposed procedure for appointing students, including selection criteria:***Please identify specific criteria that should be considered for the selection of placement students e.g. specific quantitative skills that may be required, subject knowledge etc. If a student has been pre-selected, or the research area has been led by the student, please provide the student’s contact details, and a summary of their suitability for the NEXUSS CDT REP programme.*Experience of practical electronic engineering would be most useful. Good interpersonal skills – although the sand lizards enclosure is not on show to members of the public, they may ask you questions when you are around the zoo.Enthusiasm to work with experts from a different field i.e. conservation biologists. We are interested to see your take on what we would like from technology and what is actually feasible.Knowledge of remote observing/sensing systems and their potential application to animal tracking.Knowledge of spatial data collection and analysis.If there are multiple applicants, they will be invited for interview at Marwell zoo, with the project team |