Available PhD Project:

Main Supervisor: Dr Gareth Pearce

Main Supervisor profile page: https://www.research.vet.cam.ac.uk/research-staff-directory/principal-investigators/systems-pathology/Gareth-Pearce

Co-Supervisors: Ian McCrone (University of Cambridge); Jose Chitty (Cambridge Animal Technologies)

Project Title: Managing social dynamics to improve dairy cow health and welfare

Project Description:

Modern dairy cattle production systems involve frequent regrouping of cows based on parameters such as lactation stage, milk yield and parity. However, regrouping increases intra-group aggression leading to decreases in feed intake and rumination time which result in reductions in milk yield. Regrouping also reduces lying time which leads to a significantly increased risk of lameness. Increasing the stability of cow social groups reduces aggression but factors that promote social stability in cattle groups are poorly understood. Social Network Analysis allows the structure and patterns of groups to be quantified to define the place and role of individuals within differing group structures in order to explain how group dynamics operate and are influenced by factors linked to individual attributes. Preliminary studies have shown that a small number of ‘key cows’ are particularly influential in the organisation of group social structure and have a disproportionate influence in maintaining group stability particularly after regrouping. Although not studied to date in cattle, such ‘keystone individuals’ in other species can be characterised by various individual attributes. More precise definition of characteristics and roles of keystone individuals occupying network positions that maintain stability is critically important to the dairy industry in order to manage the significant negative effects of dynamic grouping on cattle welfare and productivity. This project will help to achieve this by quantifying cow-cow interactions, social preferences and network positions using neck-mounted accelerometer sensors validated by behavioural recording. Manipulation of group composition based on network roles and individual attributes will allow management optimisation to promote group stability thereby minimising the stress factors known to detrimentally influence dairy cow health, welfare and productivity.

This is a multidisciplinary project designed to provide the student with comprehensive training in a broad range of scientific and operational skills transferable into scientific research and data driven operations management and decision making across many industries. In addition to training in applied animal behavioural science, the student will gain an understanding of the use of remote and distributed sensing technologies and associated data to provide decision making insight relevant to the use of biosensor technology to improve animal health and welfare. The combination of academic and industrial environments will provide a high level of transferable skills to enable the student to pursue a scientific career in either the academic or commercial sector. The industrial partner is a leading developer of animal monitoring and behavioural analytics sensor platforms designed to optimise cattle management efficiency, productivity, health and welfare in order to improve economic returns for farmers. The project collaboration offers an important opportunity to enable the translation of research into industrial application to benefit end-users. The industrial placement component will expose the student to the industrial partner’s multi-disciplinary team to provide hands-on experience of the business skills required to take a research project through to commercial evaluation and deployment.

The student will be expected to present outcomes of the research at national/international scientific and farmer conferences as well as author peer-reviewed journal articles on their research. Good communication skills are essential.

Candidate requirements: Candidates should have or be expected to obtain a First or Upper Second Class Honours degree and/or postgraduate qualification in animal, veterinary or applied biological sciences. Applicants with experience of animal behaviour science and handling of large data sets / statistical modelling would be particularly welcomed.

BBSRC DTP: As a BBSRC DTP iCase student the successful candidate will attend DTP training courses and events and must also spend at least three months, but no more than 18 months, with the Industrial Partner (Cambridge Animal Technologies Ltd). The full programme must be completed within 48 months.

Funding:

UK and EEA students who meet the UK residency requirements (see here) will be eligible for a full 4 year BBSRC studentship. This will cover a stipend at the standard Research Council rate (£14,553 per annum for 2017/18 [with a supplement applicable for veterinary graduates]), research costs and tuition fees at the UK/EU rate, to start 1st October 2018.

How to apply:

- Preliminary Stage: Please send your CV, transcripts and a cover letter to to Dr Gareth Pearce at gpp28@cam.ac.uk by 31st January 2018. The cover letter should outline your research interests and experience and explain why you think you would be a good fit for this project. Please also include contact details for two referees who will be contacted in the event you are shortlisted. Shortlisted candidate will be invited to interview in February 2018 (date to be confirmed).
- Secondary Stage: Following interviews the successful candidate will then need to submit a full official application to the University of Cambridge via the Applicant Portal - note there is a £50 fee for this application. A full offer will only be made once all conditions required by the University have been met.

Deadline to apply: Preliminary applications should be submitted via email to Dr Gareth Pearce at gpp28@cam.ac.uk by 5pm on 31 January 2018.

Contact for further information: Dr Gareth Pearce (gpp28@cam.ac.uk).