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| Name: | Sophia Stavrakakis | | |
| Project title: | Predicting leg soundness through biomechanical assessment of gait in pigs | | |
| Institute: | Newcastle University | | |
| Start date: | October 2010 | Finish date: | September 2013 |
| Lay summary of project (<i>in your own words</i>) About 10-20% of breeding pigs develop lameness at some point in their lives and my project is designed to develop tools to identify these pigs as early as possible. The underlying problems of lameness, such as arthritis, are often not infectious but are genetically predisposed. There is also uncertainty as to whether the type of flooring on which the pigs are kept plays a role. Furthermore, just like humans, pigs can also have “bad” postures and this can have a weakening effect on the skeleton over time. In subclinical conditions, changes in walking patterns may be picked up only by sensitive measures of the movement but would not be visible to the human eye. To investigate this we have measured whole body movement patterns of a variety of pigs over two years using a 3D camera system. We analysed the data to find those measures which can best distinguish a normal pig from one which has a lameness problem at the earliest possible stage. Movement measures relate to the time that individual hoofs spend on the ground during walking, the stride length, the movement around joints in the legs and the relationships between these measures. Some of the measures can be quite simple to obtain (e.g. stride length), whilst others would be more difficult to measure on-farm. The next step in the study is to select which of the movement measures are the most useful and develop a simpler system for lameness detection. This could be a CCTV-type camera system with an intelligent analysis tool and the ability to monitor pig movement in a pen on large-scale farms. In such a way feedback could be provided to the farmer on a daily basis so that lame pigs can be treated as early as possible. Another application is the analysis of a more complete walking profile of young breeding stock on nucleus or multiplier farms. This could confirm that the “locomotory system” of these pigs is sound and can sustain a long breeding life, without passing on unwanted genetic conditions to the next generations. | | | |
| A bit about yourself (<i>one paragraph</i>) I am a person with passion for animal science, welfare and health problems and I believe that technology has an enormous potential for assisting with many of the challenges we see in animal production. My educational and working history has been dedicated to building a solid base of knowledge and practical ability for a successful career in the service of animals and agriculture. I enjoy the freedom of thought in academic environments, people that are interested in knowledge for its own sake and the international connectivity which comes with research communication. The complexity of the mammalian body system and its unbelievable capability to adjust to challenging situations without failure fascinates me. I hope to continue with research into the secrets and mysteries of how the body system works and why it fails when it does. | | | |
| What you hope to get out of your PhD This PhD has been a special pathway of education and I have already gained considerable value from the different stages, i.e. study of the international literature, development of methodology and experimental work, data analysis and conference presentations. A PhD is a rewarding degree for a self-motivated person and only now can I feel properly mature in research procedures, knowledge generation and communication. When completing my undergraduate degree in Veterinary Medicine, I thought that I already understood almost everything, but the PhD has been a lesson that life is an endless education and only in | | | |



seeking will a person find something. We need to continuously search for new knowledge and not remain stagnant where we are, while academia produces novel insights and understandings. My PhD, in particular, has the potential not just to sit on a bookshelf but to actually trigger the application of this technology to automatic detection of lameness on large-scale farms. So I hope to be able to continue working within the wider field of quantitative lameness research in livestock, or alternatively on another health and welfare problem within an academic or industrial research environment. I believe that my education as a veterinary surgeon can be of great benefit here, since that provided me with a detailed understanding of the mammalian body physiology, pathology and rehabilitation potential, with affinity for science and practicality at the same time. Building on this, my multidisciplinary PhD research programme requires the integration of the concepts of biology, pathology and mechanical engineering which has taught me also to cooperate, network and communicate efficiently with people from very different backgrounds. Thus, I believe in the principle that “together people are stronger” and value the fusion of skill resources in teamwork.

A photograph of your work



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Signature:Sophia Stavrakakis.....

Date:30/08/2013.....