

PhD position in Applied Statistics in Quantitative Genetics

Applications are invited for a PhD position at the University of Aarhus, Faculty of Agricultural Sciences (DJF), department of Genetics and Biotechnology. The position is available for three years beginning as soon as possible.

Research area and project description

The project aims to develop mathematical and statistical methods for modelling incompletely observed traits (censored or truncated) and events with low frequency in large-scale quantitative genetic studies. In both cases the project will aim to develop multivariate extensions allowing simultaneously modelling traits of different nature (*e.g.* by applying suitable multivariate versions of generalized linear mixed models).

In the case of the incompletely observed traits the typical example is the time to occurrence of an event (*e.g.* death, conception or disease onset) and the idea is to adapt classic techniques of event-history analysis and survival analysis (Cox proportional models, frailty models, accelerated failure models, etc) to a context of quantitative genetics with complex structure of random components. We will investigate alternative inference methods based on computer intensive re-sampling techniques and suitable U-statistics.

With regards to modelling events with low frequency, the idea is to take advantage of the close mathematical connection between modern methods of event-history-analysis and nested case-control techniques, to develop a range of statistical tools relevant to applications in quantitative genetics. This will make use of the modern theory of counting processes.

The applications of the methods developed in the project will involve genetic studies on longevity of sows, mortality of cows and disease incidence in pigs, among others. The project is related to and extends an existing research line on livestock quantitative genetics and breeding value prediction at the Research Group of Bioinformatics, Genetics and Statistics.

The project requires a strong background in statistics and probability theory. It is assumed that the candidate has already had contact with formal probability theory (*e.g.* axiomatic treatment of probability) and theoretical statistics (*e.g.* classic theory of inference in parametric models, multivariate analysis and models for discrete variables) since it will not be possible to build-up these skills during the PhD program. Furthermore, computer skills and some experience with applied statistics are required. Knowledge of basic genetics will be considered an advantage but will not be a necessary condition.

Qualifications

Applicants to the PhD position must have a relevant Master's degree (or equivalent), *e.g.* a master in mathematics/statistics or a master in genetics (but in this case with a very strong mathematical and statistical background, see the last paragraph of the "Research area and project description" above). Exceptionally, candidates with non-concluded Master's degree can be accepted, provided there is documentation that the Master education is in its very last phases (with prediction for finalization at most 2 months after the application deadline) and in this case acceptance will be conditioned on the finalization of the Master education. Documentation for final thesis and date of examination must be enclosed in the application.

Place of Employment and Place of Work

The place of employment is the University of Aarhus, and the place of work is the Faculty of Agricultural Sciences, Blichers Allé 20, 8830 Tjele, Denmark.

Salary and Terms of Employment

Salary and terms of employment are according to current agreement for state-employed academics and government circular from the Ministry of Finance regarding PhD students as well as the appointment structure of 2007 for scientific personnel at universities.

The salary level for PhD students with qualifications corresponding to a Danish Master degree is approx. DKK 288,000 per year excluding pension (corresponding to USD 48,600 / EUR 38,600 per year - depending on the rate of exchange at the actual time of employment).

Matriculation as a PhD student will be in accordance with Ministerial Order no. 18 of 14 January 2008 on the PhD Programme at Universities, and matriculation at the Faculty of Agricultural Sciences is a prerequisite for employment as a PhD student.

Applicants seeking further information are invited to contact: senior researcher Rodrigo Labouriau, tel. +45 89 99 16 66 or e-mail rodrigo.labouriau@agrsci.dk (see also <http://genetics.agrsci.dk/~rsl/PhDEventHistoryQGenetics> for further details)

Application

In order for your application to be taken into consideration you must meet the requirements stated in the application form (please find the application form [here](#))

Please send your application to the following address: SAFE@agrsci.dk

Closing date for applications is 15 April 2009 at 12.00 noon.

Applications received after the closing date for applications will not be considered!

The University of Aarhus encourages all, irrespective of personal background, to apply.

The University of Aarhus has 35,000 students, 8,500 members of staff and a turnover of DKK 4.8 billion in 2008. The university's strategy and development contract are available at <http://www.au.dk/en/strategy>