

Research Training Group π^3 :
Parameter Identification – Analysis, Algorithms, Applications



π^3 is a collaborative project between mathematicians of the Center for Industrial Mathematics (ZeTeM); mathematicians in analysis, topology, and statistics; and applied scientists of the University of Bremen. We invite applications for a

PhD position (75% of a full position)

in the area of statistics in the framework of project R3-7: **Post-selection inference for prediction performance.**

Prediction performance of statistical models is quantified by measures like e.g. prediction accuracy or area under the receiver operating characteristics. It is well known, that in-sample estimates of such prediction performance measures are upwards biased and hence lead to an overestimation of the model's ability to predict the outcome of future observations. To overcome this issue, sample-splitting, cross-validation and bootstrapping methods have been developed that lead to substantially reduced biased estimates for the prediction precision. Often statistical inference like hypothesis testing and interval estimation of the considered prediction performance measure is required or at least desirable. Given the complicated process in the estimation of the prediction precision, it is extremely difficult to develop methodology for an exact or at least asymptotically valid post-selection inference for prediction performance. As a consequence, the validation of the prediction performance of the newly developed classifier or predictor is usually deferred to a separate and independent validation study. In order to simplify this process and to increase the validity of the study in which the classifier and predictor is developed, it would be desirable to have statistical methods and tools for a post-selection inference of model prediction performance.

We are searching for an enthusiastic and committed researcher with interest in applied statistics as well as in developing and applying new mathematical models and algorithms. Within the research training group, the PhD student will be part of the Applied Statistics and Biometry group at the Faculty of Mathematics and Computer Science, working under the supervision of Prof. Werner Brannath.

Requirements:

- M.Sc. or equivalent degree with excellent grades in mathematical sciences or related fields.
- Skills in scientific or statistical programming.
- Experience in advanced statistical methods is advantageous.
- Industry or research internships are advantageous.
- Fluency in English.
- Desire to work in an international and interdisciplinary team.

The position is for a fixed term of 3 years. The earliest starting date for each position in the research training group is 1 October 2019. The salary is according to the German federal employee scale TV-L E13, 75% of a full position (i.e., approximately € 1700-1900 monthly net income). This call is open until all positions are filled.

Applicants are invited to submit their letter of motivation including a reference to PhD project R3-7, an extended CV including copies of certificates, a publication list (as far as applicable), one recommendation letter from a math professor, and contact information of two more scientists as possible referees.

The recommendation letter should be sent by the math professor directly to us (pi3-application@math.uni-bremen.de), while the application file should only include her/his name and affiliation.

All relevant documents, quoting the official reference number A 297 / 18, should be submitted by January 13, 2019, – preferably electronically as a single PDF file to pi3-application@math.uni-bremen.de – to the π^3 -coordination: Dr. Tobias Kluth, Zentrum für Technomathematik, Universität Bremen, Bibliothekstr. 5, 28359 Bremen.

The University of Bremen has received a number of awards for its gender and diversity policies and is particularly aiming to increase the number of female researchers. Gender equality will be given special emphasis within this research training group. Applications from female candidates, international applications and applications of academics with a migrant background are explicitly welcome.

Disabled persons with the same professional and personal qualifications will be given preference.

Further enquiries may be addressed to

Prof. Werner Brannath
Faculty of Mathematics and Computer Science
brannath@math.uni-bremen.de