



(REF: ISBA/2014/03/01)

**The Institute of Statistics, Biostatistics and Actuarial Sciences (ISBA) of the Universit  catholique de Louvain (UCL), Louvain-la-Neuve, Belgium, has a vacancy for a two-year fulltime postdoc position.**

### **Job description and topic**

#### *Efficient rank-based estimation in semiparametric copula models*

In a semiparametric copula model, the copula is assumed to belong to a parametric family, while the margins are unspecified. Inference on the copula parameter is an important problem which is not yet completely understood. Given the group structure of the model, it is natural to use rank-based estimators. The most popular rank-based estimator is the pseudo-likelihood estimator. However, it is known that in general, this estimator is not semiparametrically efficient.

To arrive at an efficient rank-based estimator, at least two avenues can be explored: first, a one-step update estimator, and second, a maximum rank-likelihood estimator. The update technique has already been applied in the special case of Gaussian copula models. However, for general copula models, the update step is challenging, as it depends on the efficient score function, whose components are given as the solutions of a coupled system of Sturm-Liouville differential equations. The maximum rank-likelihood estimator exploits the idea that the reduction to ranks should involve no loss of information. In the case of Gaussian copula models, this method has shown good performance in Monte Carlo simulations. Its large-sample properties, however, remain to be discovered.

### **Requirements**

PhD in statistics or a related discipline.

Good knowledge of written and spoken English is required. No knowledge of French is required.

### **Terms of employment**

Grant of 2 years – from July 1, 2014 to June 30, 2016

### **Research environment**

The Institute of Statistics, Biostatistics and Actuarial Sciences (ISBA, <http://www.uclouvain.be/isba>) is a renowned research centre of high international reputation which offers a stimulating work environment. It is equipped with modern computing facilities, a statistics library, a vivid visitors program and ample funding for scientific travel.

At the ISBA there are around 30 pre- and postdoctoral researchers working under the supervision of 10 full-time professors, in a variety of fields of methodological and applied statistics, including biostatistics and actuarial sciences. They are integrated into the Graduate School in Statistics and Actuarial Sciences which offers them an up-to-date training in their field via regular seminar series, short courses and workshops, all in English and often given by international short and long-term visitors. A high percentage of the PhD students graduate from the ISBA and succeed in starting a promising career, be it in academia or industry. ISBA is also part of a large international research network. It has numerous academic contacts, including those to neighboring fields (medicine, agronomy, social science, economy, finance and engineering) as well as collaborations with industry. It is placed in the heart of a modern, lively

and international university campus, in close proximity of Brussels and its international airport, and at short distance to other European capitals.

### **Information**

For administrative questions or for more information regarding the application procedure, please contact Mrs. N. Guillaume ([nancy.guillaume@uclouvain.be](mailto:nancy.guillaume@uclouvain.be)).

For further information on the scientific project, please contact Prof. J. Segers - [johan.segers@uclouvain.be](mailto:johan.segers@uclouvain.be)

### **Application**

Please send the following documents to Mrs. N. Guillaume ([nancy.guillaume@uclouvain.be](mailto:nancy.guillaume@uclouvain.be)):

- a letter of motivation
- your curriculum vitae
- a list of publications
- copy of diplomas
- at least one reference letter

The closing date for application is April 15, 2014 (applications received after April 15 will be considered as they arrive, until the position is filled). Only duly completed applications can be taken into account.