ULB UNIVERSITÉ LIBRE DE BRUXELLES

science4refugees

HR EXCELLENCE IN RESEARCH

FULL-TIME ACADEMIC POSITION IN *DATA-DRIVEN MODELING OF MULTI-SCALE BIOLOGICAL PROCESSES*

SCHOOL OF ENGINEERING

Reference : 2017/Axxx
Application deadline:
Start date: 01/10/20xx

Job description

A mechanistic understanding of complex biological systems and processes requires the consideration of multiple spatial and temporal scales, and their integration into holistic models or networks. Fluctuations play a major role in the dynamics of many of these processes, which makes stochastic modeling often indispensable to obtain a realistic description of these systems and their evolution. The large amounts of high-throughput biological data that are currently being produced, from the molecule to the organism scales, are an unprecedented source of information and a stepping stone to advance these issues.

To address the key challenges of data-driven multi-scale modeling, innovative mathematical and computational modeling approaches need to be developed. The candidate should be an expert in multi-scale and multi-methodological (deterministic and stochastic) modeling of biosystems, and have solid experience in several of the following techniques:

- Physics-oriented multi-scale modeling
- Model-based data integration
- Dynamical and stochastic modeling of complex systems
- Model optimization techniques
- Data-driven modeling of biological networks
- State-of-the-art machine learning approaches
- Computational single-cell analysis/microfluidics

The candidate should have expertise in the application of these methods to several of the following systems:

- Biomolecular, subcellular, cellular, multicellular systems
- Biological networks such as the metabolome, interactome, gene regulatory networks, disease networks, connectome
- Population dynamics and ecological networks

Area of Research: Transdisciplinary – (bio)engineering, (bio)physics, (bio)mathematics

Educational and scientific goals: The successful candidate is expected to integrate the existing teaching activities of the Schools of Engineering and Bioengineering, and to develop new, top-level, scientific activities in collaboration with other groups of the Schools of Engineering and Bioengineering and the Faculty of Sciences (ULB/VUB).

Courses covered at the time of recruitment: The candidate should be able to teach the course:

- PHYS-H101: Connaissances fondamentales et éléments de physique

to BA1 Bioengineering students, and contribute to some of the general bachelor courses in mathematics of the School of Engineering, such as:

- MATH-H1001 : Éléments d'algèbre et d'analyse
- MATH-H1002, MATH-H200: Analyse I, II
- MATH-H1003 : Algèbre linéaire et géométrie
- MATH-H202 (*partim*) : Analyse numérique et équations aux dérivées partielles

She/he should also contribute to some of the existing master courses in the chemistry, bioengineering, physics, biomedical and informatics departments of the School of Engineering, in the fields of biophysics, molecular modeling, bioinformatics, artificial intelligence, and/or dynamical and stochastic modeling, such as:

- BING-H4000 : Modélisation et contrôle des systèmes dynamiques en bioingénierie (*partim*)
- BING-H5000 : Introduction à la bioinformatique et à ses applications (*partim*)

Qualifications required :

PhD Degree (with doctoral thesis) in Engineering or Sciences (Applied Mathematics or Physics)

Skills required

- Applicants should have at least 4 years of research experience at the time of their recruitment.
- Post-doctoral experience and an excellent scientific record are a plus.
- Exchange periods outside of the applicants' home institution (during or after their PhD) will be taken into consideration when evaluating applications.
- Applicants who do not speak French (level B2 *ou* C1 *à déterminer par la faculté*) may be granted a period of adaptation, but they must be able to teach in French at the end of the third year following their appointment.
- … *+ items qui vous semblent nécessaires*

Interested ?

For more information, please contact Mr/Ms xxx (telephone: +32 2 xxx.xx.xx – E-mail: xxx@ulb.ac.be).
Applications must be sent by e-mail to the rectorate of the Université Libre de Bruxelles (recteur@ulb.ac.be) and to the faculty deanship (xxx.xx@ulb.ac.be).
They must include the following :

- an application letter
- a Curriculum vitae including a list of publications (a template can be downloaded at http://www.ulb.ac.be/tools/CV-type.rtf)
- any relevant documents showing 4 years of research experience
- a 7,000-character report (4 pages) presenting the applicant's research activities and a research project, including how these will integrate into ULB's research teams

- a teaching dossier including a 7,000-character report (4 pages) on the applicant's previous teaching activities and a teaching project for the first five years in this position; these must be relevant to the faculty and to the teaching profiles for the programmes to which the applicant is to contribute
- a note on the applicant's international achievements and projects (no more than 4 pages)
- the names and e-mail addresses of five referees (respecting the gender balance) who may be contacted by those in charge of evaluating applications. These referees should not have conflicts of interest because of family or emotional ties.

By sending in their application, applicants acknowledge they have read and understood the additional information and the regulations relevant to research staff, available at the following address http://www.ulb.ac.be/emploi/academique.html.