basque center for applied mathematics

IC2019_AI BCAM International Call

Postdoctoral Fellowship in Metabolic Modelling

Job Offer	
Topics:	In the framework of the BCAM "*Maths & Artificial Intelligence*" strategy, a series of projects in this field are launched in different areas of Applied Mathematics. The project "***Predictive metabolic modelling of microbiomes and human metabolism through Monte Carlo sampling***" is run in collaboration with the Quantitative Metabolic Modeling group at Berkeley National lab (LBNL). Our goal is to produce a predictive model of microbiome and human metabolism by leveraging high performance computing to efficiently sample the full metabolic phase space. For this purpose, we will use a novel Markov Chain Monte Carlo (MCMC) Bayesian inference (BI) approach enhanced through Deep Learning. Microbiomes (i.e. microbial communities harboured by human beings) are key players in human health: they can produce obesity, decrease autism symptoms or increase athletic performance. Microbiome engineering could replace medical treatment through external drugs by creating tailored engineered microbiotas. However, this requires the ability to predict microbiome behaviour. Genome-scale models (GEMS) can provide this predictive power by accounting for all metabolic reactions in an organism genome. We plan to apply novel deep learning methodologies to speed up the traditional Monte Carlo approach used to sample the metabolic space and produce testable predictions.
PI in charge:	Elena Akhmatskaya (BCAM) & Hector Garcia Martin (LBNL)
Salary and conditions:	**The gross annual salary of the Fellowship will be 28.000 - 32.000€.** It will then be on your own responsibility to make your yearly income declaration at the Bizkaia Treasury Agency. There is a moving allowance for those researchers that come from a research institution outside the Basque Country from EUR 1.000 to EUR 2.000 gross. *Free access to the Public Health System in Spain is provided to all employees.*

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No Positions offered:	**#1**
Contract and offer:	**1 year at BCAM, extensible 1 year more at Berkeley Lab contingent upon the availability of funds and candidate's credentials.**
Deadline:	**September 13th 2019, 14:00 CET (UTC+1)**
How to apply:	Applications must be submitted on-line at: http://www.bcamath.org/en/research/job

Scientific Profile Requested	
Requirements:	• Promising young researchers. • Applicants must have their PhD preferable in Applied Mathematics, Computational Statistics, Computer Science, Physics, Electrical Engineering or related fields.
Skills and track-record:	• Good interpersonal skills. • A proven track record in quality research, as evidenced by research publications in top scientific journals and conferences. • Demonstrated ability to work independently and as part of a collaborative research team. • Ability to present and publish research outcomes in spoken (talks) and written (papers) form. • Ability to effectively communicate and present research ideas to researchers and stakeholders with different backgrounds. • Fluency in spoken and written English.
Scientific Profile:	The preferred candidate will have: • Strong background in applied math and machine learning. • Demonstrated knowledge in Monte Carlo sampling and Bayesian inference. • Good programming skills in Python, as well as good software development practices (i.e. version control software usage and embedded tests). • Research experience in applied Statistics in interdisciplinary applications (e.g.: Health, Energy). • Interest in metabolism and biochemistry.

Application and Selection Process	
Formal Requirements:	The selected candidate must have applied before the application deadline online at the webpage http://www.bcamath.org/en/research/job

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	The candidates that do not fulfil the mandatory requirements will not be evaluated with respect to their scientific profile.
Application:	Required documents: ▪ CV ▪ Letter of interest ▪ 2 recommendation letters ▪ Statement of past and proposed future research (2-3 pages)
Evaluation:	Based on the provided application documents of each candidate, the evaluation committee will evaluate qualitatively: the adaption of the previous training and career to the profile offered, the recommendation letters, the main results achieved (papers, proceedings, etc.), the statement of past and proposed future research and other merits; taking in account the alignment of these items to the topic offered.

Incorporation:	**November 2019 or as soon as possible thereafter** *The BCAM postdoctoral contract will start when the selected candidate has finished the PhD, i.e. after dissertation defence.*

EUSKO JAURLARITZA
GOBIERNO VASCO