basque center for applied mathematics

EXCELENCIA SEVERO OCHOA

IC2020_12
"BCAM Severo Ochoa Joint Postdoctoral Program"
International Call

Postdoctoral Fellowship in AS & CFDMS

Job Offer	
Topics:	In the framework of the BCAM Severo Ochoa Joint Postdoctoral Fellowship Program, the research lines of: - Computational Fluid Dynamics - Modelling and Simulation. - Applied Statistics. offer a position in the following topics: Pedestrian Flow Dynamics, Particle-based simulation, Agent Based Simulation, Data Assimilation. Title: **Modelling crowd flow in the presence of a pathogen.** The accurate prediction of the dynamics and properties of a dilute-to-dense crowd flow of pedestrians under complex external conditions is critical for strategic urban planning. Pedestrian models rely on a stochastic particle-based description of human interaction, where individuals are regarded as "particles" interacting via different competing forces (i.e. short-range contact repulsion and friction, long-range social distancing) and a target desired velocity which is environment-specific. Moreover, in the extraordinary health-care situation posed by COVID-19, a mathematical and numerical analysis of pedestrian flow combined with new infection models could represent a useful tool to predict the spreading of the disease in urban scenarios for control/mitigation purposes. The target of this project is to formulate a novel particle-based simulation framework to model pedestrian dynamics fully coupled with stochastic infection-transmission models and apply it to urban situations characterized by the presence of large groups of people in motion. The postdoctoral candidate will work under the supervision of Ikerbasque Prof. Marco Ellero (CFD group, BCAM) and Dr. Dae-Jin Lee (Applied Statistics group, BCAM) on the developments and use of

	discrete particle-simulation methods to better understand the dynamics of pedestrian flows.
PIs in charge:	Marco Ellero and Dae-Jin Lee
Salary and conditions:	**The gross annual salary of the Postdoctoral 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 up to EUR 2.000 gross. *Free access to the Public Health System in Spain is provided to all employees.*
No Positions offered:	**#1**
Contract and offer:	1 year
Deadline:	~~**7th January 2021, 14:00 CET (UTC+1)**~~ **21st January 2021, 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 completed before the contract starts. • PhD degree in engineering, physics, mathematics or related area.
Skills and track-record:	• A proven track record in quality research, as evidenced by research publications in top scientific journals and conferences. • Ability to effectively communicate and present research ideas to researchers with different background. • Ability to clearly present and publish research outcomes in spoken (talks) and written (papers) form. • High level of spoken and written English. • Good communication and interpersonal skills
Scientific Profile:	The preferred candidate will have: • Strong background in Scientific Computing.

	• Strong research background in general particle-based techniques (e.g. Discrete Element Methods, Dissipative Particle Dynamics etc.) is required. • Previous experience in "pedestrian dynamics" and agent-based models is desirable. • Demonstrated knowledge in Data Analysis techniques. • Excellent programming skills in Python, R, Fortran, C or C++.

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 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:	**Before June 2021** *The BCAM postdoctoral contract will start when the selected candidate has finished the PhD, i.e., after dissertation defence.*