

## Job Description and Selection Criteria

<b>Job title</b>	One Postdoctoral Research Assistants in Artificial Intelligence (deep learning, machine learning, image processing) for urban studies.
<b>Division</b>	RiSE-group
<b>Location</b>	Universidad EAFIT. Carrera 49 N° 7 Sur-50, Medellín (Colombia)
<b>Salary</b>	6.171.980 COP - Senior Researcher I
<b>Hours</b>	Full time
<b>Contract type</b>	3 years (subject to a 9 month probationary period)
<b>Reporting to</b>	Dr. Juan Carlos Duque
<b>Vacancy reference</b>	<i>PEAK-EAFIT-001</i>
<b>Additional information</b>	<p>This position is subject to a 9 months probationary period.</p> <p>This position is funded by RCUK grant ‘PEAK’, and is available from April 1st 2018 (or as soon as possible thereafter, see below for details)</p> <p>This is a full-time position that cannot be held concurrently with any other substantive contract without the explicit permission of Dr. Juan C. Duque.</p> <p><b>(PLEASE NOTE: Applicants are responsible for contacting their referees and making sure that their letters are received by the closing date)</b></p>

## The Appointment

We invite applications for 1 Postdoctoral Research Assistant position, funded by RCUK GCRF ‘PEAK Urban’ grant to work with Dr. Juan C. Duque at the RiSE-group, Universidad EAFIT. This is a three-year post subject to confirmation of funding via an external RCUK grant review at 12 months. Hence, this is a fixed-term post for 12 months in the first instance, and funding beyond this point to 36 months is dependent on a successful RCUK grant review in Autumn 2018. This post is available from April 1<sup>st</sup> 2017 (there may be some flexibility in the start date, but no later than June 1<sup>st</sup> 2017).

The post-holder will join an international cohort of postdoctoral scholars within the PEAK Urban project, a 4-year, international, multidisciplinary GCRF program involving Oxford researchers at Anthropology (COMPAS), the Mathematical Institute, Geography (Transport Studies Unit) and

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Medicine (George Institute), along with universities in China (Peking University), South Africa (University of Cape Town), India (Indian Institute for Human Settlements) and Colombia (Universidad EAFIT).

Working across borders and disciplines, this is a unique opportunity to develop and apply tools and techniques from Artificial Intelligence (deep learning, machine learning, image processing) to generate innovative solutions to the challenges faced by rapidly expanding cities. Through our research, we want to help these cities achieve the Sustainable Development Goals set by the United Nations. Using a range of techniques in deep learning, machine learning, and image processing, as well as interfacing with a variety of analysis tools from geography and spatial economics, we will study the dynamics of urban economies, and their relation to space on multiple scales. We will take advantage of a range of data sources, from administrative micro data on employees, to telecoms, commuting and remote sensing data.

The researcher will collaborate directly with academics and policy-makers in Colombia, and possibly Oxford, South Africa, India and/or China, to maximize relevance and impact. The post-holder will also attend an annual summer school with other postdoctoral researchers from around the world, and will have an opportunity to spend time within a partner research institution (Oxford, Cape Town, Bangalore or Beijing) as appropriate to their research project.

### **Responsibilities/duties**

The successful candidate will be expected to:

- To develop new research methodologies, reviewing and refining theories as appropriate, at the interface between mathematics, data science, economics, geography and urban policy;
- Develop ideas for new research projects alongside Dr. Duque and other participants in the PEAK Urban project, and for generating research income;
- Manage own academic research and administrative activities. This involves small scale project management, to co-ordinate multiple aspects of work to meet deadlines;
- Fully participate in the activities of Dr. Duque's research group, including mentoring of students and project supervision where appropriate;
- Collaborate with a network of international academics, and link with policy-makers based in both governmental and non-governmental organizations;
- Collaborate in the preparation of research publications, book chapters, and policy reports;
- Present papers at conferences or public meetings;
- Travel periodically to work alongside international colleagues as appropriate, attend conferences, and participate in annual global project meetings ('summer schools').

### **Selection criteria**

- A PhD awarded, or a Master's degree and PhD submitted (at the time of taking up the position) in mathematics, computer science, cognitive systems or a related discipline. A candidate with a PhD in social science with a significant data-science component, or postdoctoral experience in this field, may also be considered;
- A research background in deep learning, machine learning, image processing;

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- A good research and publication record, judged by the candidate's career stage;
- Excellent computational skills (e.g., highly proficient at coding in chosen language(s), preferably Python, and handling large datasets);
- Excellent communication, inter-personal and writing skills;
- The ability to work independently, including decision-making, problem-solving, planning and organizing;
- Enthusiasm and willingness to work with international collaborators, and travel regularly.

**Desirable selection criteria**

- A proven ability to communicate research with policy makers and with non-mathematical (other sciences and social sciences) and non-academic audiences;
- Experience in international and/or cross-disciplinary academic collaboration;
- Experience of working with socioeconomic data;
- Experience of working on deep learning, machine learning, image processing applied to urban contexts.

## About the Universidad EAFIT

### EAFIT Inspires, Creates, Transforms

EAFIT is a university that inspires the current generations to embark on a life project that maximizes their potential. It is an institution that both conveys and generates knowledge, thus fulfilling its role as a teaching and research university. It transforms society.

A university that is constantly growing, transcending regional and national boundaries and connecting with the world, today's EAFIT is a place where quality, pertinence and values are encapsulated in our institutional mission to form better women and better men who contribute to the country's social, economic and scientific progress.

The research at Universidad EAFIT is an institutional decision, as well as explicitly in its purposes. EAFIT generates and transmits knowledge to solve problems that transcend the national level. The budget allocated to this area has increased over time and enabled EAFIT to achieve a range of objectives, including recognition by Colciencias of 44 research groups, the registration of 30 patents, and the participation of more than 900 students in research incubators.

Therefore, with the implementation of scientific and applied research processes, in permanent interaction with the business, government and academic sectors, the Institution aspires to be recognized nationally and internationally for its academic and research achievements, for this, it promotes, among other things, the scientific and innovative production that contributes to the resolution of problems that transcend borders.

To fulfill this purpose, our system is articulated through the research communities represented by their research groups and seedbeds that, through the realization of activities and projects, will contribute to institutional academic strengthening. All this contemplated under the framework of the policies, objectives and provisions of Law 1286 of 2009 on Science, Technology and Innovation.

For more information please visit <http://www.eafit.edu.co/>

### The RiSE group

The RiSE group seeks to provide innovative solutions to the challenges faced by rapidly expanding cities. These solutions have as central axis the strategic management of the urban space, current and future, to achieve greater prosperity and an inclusive and sustainable growth.

As a multidisciplinary research group we are dedicated to the development of new quantitative methods for spatial analysis and the exploration of new ways of measuring socioeconomic variables through social networks or remote sensing. Our methods are published in leading international journals and many of our methods are distributed free of charge through open source software.

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Among the techniques we use are spatial econometrics, neural networks, machine learning, and optimization.

RiSE has a long research trajectory that place it in the highest category (A1) according to the national ranking published by Colombian Administrative Department of Science (Colciencias).

Our funding mainly comes from Universidad EAFIT and organizations such as Research Councils UK (RCUK), UN-Habitat, Inter-American Development Bank, The World Bank, Development Bank of Latin America, among others.

### **How to Apply**

To apply, please send the following materials to [jduquec1@eafit.edu.co](mailto:jduquec1@eafit.edu.co):

- Cover letter addressing your qualifications and research interests. The letter should describe how you meet the selection criteria outlined in the job description;
- Curriculum vitae;
- Details of two referees, one should include the applicant's current or most recent employer.  
**NOTE: referees letters must be received from your referees by the closing date for your application to be complete;**
- Also provide a representative publication or recent working paper.

Please upload all documents as **PDF files** with your name and the document type in the filename.

Applicants should ask their referees to send their letters of reference **DIRECTLY** to: [jduquec1@eafit.edu.co](mailto:jduquec1@eafit.edu.co)

All applications must be received by 12:00 noon Colombia time on February 28th, 2018.

### **Equality of Opportunity**

Entry into employment with the University and progression within employment will be determined only by personal merit and the application of criteria, which are related to the duties of each particular post and the relevant salary structure. In all cases, ability to perform the job will be the primary consideration. No applicant or member of staff shall be discriminated against because of age, disability, gender reassignment, marriage or civil partnership, pregnancy or maternity, race, religion or belief, sex, or sexual orientation.

### **Benefits of working at the University**

#### **Community Wellbeing**

The wellbeing of members of the EAFIT community is achieved through sporting activities, artistic events, and access to spaces on campus where they can pursue healthy lifestyles.

Above and beyond the academic and scientific aspects, the university concerns itself with nurturing the multifaceted development of all members of the EAFIT community. In this regard, the Human Development-University Wellbeing Division promotes the wellbeing of everyone on campus: students, faculty and administrative staff, alumni, and retirees. This division also seeks to promote

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its members' future prospects, self-improvement, and personal and professional growth based on a philosophy of mutual care and concern.

- **Sports**

The Sports and Recreation Department's overarching mission is to promote healthy lifestyles that translate into a balance between mental and physical health. Both students and employees benefit from a sports offering that includes swimming, men's and women's soccer, tennis, track and field, taekwondo, chess, ultimate, volleyball, basketball, indoor soccer, softball, karate, table tennis, ecological walks, and water aerobics.

- **Artistic Development**

Offering a range of activities involving creation and artistic expression, this department – located in a house in the La Aguacatala neighborhood – responds to the institution's mission to promote artistic activities for the use of free time. Its portfolio of services is intended for students, employees and families, sometimes for people from outside.

Courses on a variety of subjects are open to the community, including jewelry making, painting for children, adolescents, and adults; photography (digital camera), photography (studio lighting), photography (Street Photography), dance, jewelry, analogous illustration, Amigurumis, self makeup, and lettering. Other offerings include the children's choir, university choir, the Al Compás ballroom dancing group, the Ecléctico music group, the Movimiento Danza urban dance group, the Contradanza folkloric dance group, the Letras literary group, the La Colombina folk music group, stage crew. More information you can visit: <http://www.eafit.edu.co/bienestar-universitario/desarrollo-artistico/talleres-artisticos/Paginas/talleres-artisticos.aspx>

- **Health Services**

The Medical Service and Occupational Health Department helps foster prevention and mutual care among the university community. Its services include first aid, general medical check-ups, dental services (under an agreement with CES), nutritional consults (under agreements with third parties), health prevention and promotion activities such as the Health Fair, vaccination and blood drives, and a health services directory.

- **Employee Wellbeing**

The Employee Development and Benefits and Compensation departments look after the professional and personal wellbeing of everyone who contributes on a daily basis to the university's Mission and Vision.

In that regard, both departments promote excellent working conditions for EAFIT faculty and staff and access to services that promote their development and improve their quality of life and that of their families.

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**Other offers on the university campus:**

**Cultural Life**

Culture is a key source of inspiration on campus, since EAFIT firmly believes it is an essential part of the preparation of well-rounded professionals.

The EAFIT campus is a space where the creation, support for, and dissemination of different artistic disciplines fosters the multifaceted development of the university community and the general public. The activities held throughout the year include exhibitions, concerts, recitals, film cycles, theatrical works, and literary colloquiums.

**Sports and Fitness Areas**

- **Athletic Facilities**

EAFIT makes a broad range of competitive sport and recreational facilities available to the university community and the general public, including an artificial turf field, a natural grass field, a tennis court, two multi-sport fields, and a swimming pool.

- **Vivo Physical Conditioning Center**

The university encourages physical activity and healthy lifestyles among its students, employees and their families, alumni, and retirees and their families, providing them a space equipped with state-of-the-art technology and staffed at all times with qualified fitness instructors.

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