Research fellowship on: Search engine for touristic destinations: fairness and explainability of ranking techniques based on machine learning, PNRR iNEST Project, Interconnected North-East Innovation Ecosystem - Implementing Entity: University of Padua, - CUP: H43C22000540006

The present document in English is to be considered as a mere summary of the main provisions of the notice of competition which is available in Italian at the following (link) The text in Italian is the official text of the notice of competition for all legal intents and purposes and, in the event of non-conformity with the present document, it shall prevail.

Description

The "Centro temporaneo Progetto Ecosistema dell'Innovazione" at Università Ca' Foscari Venezia, in charge of the administrative management of the above-mentioned project, invites applications for a fellowship in:

Title: Search engine for touristic destinations: fairness and explainability of ranking techniques based on machine learning

SSD or Research sector: INF/01

Scientific coordinator or supervisor: Prof. Salvatore Orlando

Duration: 24 months

Abstract: This research project is concerned with the development of vertical search engines for tourist destinations, hospitality facilities, and general territory information for tourists. Current search engine technologies use Machine Learning (ML) algorithms, particularly models called Learning-to-Rank (LtR), to re-rank the results to be proposed to users. These search engines use complex features, related to the user's query and context, as well as features that describe the resources to be searched (such as documents, POIs, etc.) to identify the most relevant results that can satisfy the users' information need. In addition, Deep Learning (Neural Information Retrieval) techniques are beginning to be used to fill possible semantic gaps related to the use of natural languages in formulating queries and descriptions of objects to be searched.

Among the most challenging research problems in this area, we have fairness and explainability of decisions made by ranking systems. Fairness is related to the datasets used for training ML algorithms, which may contain sampling-related biases, thus generating models that produce discriminatory ranking with respect to groups of users (e.g., male/female) or groups of tourism resources to be reordered by relevance (e.g., hotels/apartments). Moreover, the explainability of ML decisions, which corresponds to linking the instance features to the relevance predictions of an LtR model in a way that users may easily understand, can highlight which features of queries, user profiles, or relevant objects returned to the user, triggered the ranker's decisions. While fairness, appropriately certified, can increase the trust of users (e.g., hospitality facility managers who are interested in a fair exposure of their products in the rankings returned by the search engine), explainability can improve the loyalty of tourists, i.e., end users of the search engine.

The research may be carried out in English.

The fellowship is intended to provide the successful candidate with the opportunity to pursue his/her own research while benefiting from the range of expertise at Università Ca' Foscari Venezia.

Who can apply

Prospective candidates are expected to hold a master's degree in computer science or equivalent title obtained abroad and a professional scientific curriculum suitable for carrying out research activities..

Ca' Foscari encourages applications from researchers with positive evaluation in all the criteria in individual proposals such as Marie Skłodowska Curie Actions - Individual Fellowships/ERC Starting Grants/FIRB (Italian Fund for basic research investments)/SIR (Scientific Young Independence Research) or similar.

Researchers having successfully completed Marie Skłodowska Curie Actions - Individual Fellowships/ERC Starting Grants/FIRB (Italian Fund for basic research investments)/SIR (Scientific Young Independence Research) or similar funded projects are warmly encouraged to apply.

The following are considered preferential qualifications:

- the PhD;
- the completion of attendance at a doctorate course pending the award of the qualification;
- specialization diplomas and certificates of attendance at postgraduate specialization courses, obtained both in Italy and abroad; the performance of documented research activities carried out with public and private entities both in Italy and abroad;
- Competences and experiences in the domain of search engines.
- Knowledge about applied machine learning techniques.
- Academic and/or professional experiences with application fields of search engines

Duration of contract: 24 months (approximately starting in April 2023)

Stipend: The research fellowship amounts to 21.401,93 Euros per year, gross percipient net of charges to be borne by the institution.

Deadline for submission of applications: January 09, 2023, 12.00 noon CET.

How to apply:

Candidates must submit:
1. The application form
2. A motivation letter (max 1 page) along with their CV in European format, duly dated and signed, both enclosed as a one single.pdf file. (link)
3. A copy of a valid identity document (either Identity Card or Passport);
4. (If available) Evaluation Summary Reports of Marie Skłodowska Curie Actions - Individual Fellowships/ ERC Starting Grants/FIRB (Italian Fund for basic research investments)/SIR (Scientific Young Independence Research) individual proposals having passed all the evaluation thresholds;
5. (If available) Details of Marie Skłodowska Curie Actions - Individual Fellowships, ERC Starting Grants, FIRB (Italian Fund for basic research investments)/ SIR Scientific Young Independence Research funded projects;
6. A declaration of availability to hold the interview online (template available at this Link), which is to be emailed to: inest_pnrr@unive.it
7. Any other documents, qualifications and publications deemed relevant for the selection procedure (See the notice at this link).
Templates for the above mentioned documentation are available on the University's website (link).

How to submit your application

Applications must be submitted online, exclusively through the procedure that can be entered at the following link:

https://apps.unive.it/domandeconcorso-en/accesso/inest09012023motori

After submitting the application, the candidate will receive a submission number and an e-mail acknowledging receipt of his/her application.
The candidate can, if necessary, access the procedures and update uploaded data and materials via the link provided by the e-mail. Updates are only accepted before the deadline of **January 09, 2023, 12.00 noon CET**
Please note that the candidate can contact the University for any support needs until 24 hours prior to the deadline.
In case of a high number of applications and / or weight of the materials uploaded by the candidates the system might become slower, therefore it is suggested not to start the application process close to the deadline.

NB: The University does not take on responsibility for wrong or late communication of addresses, nor for any communication problem not depending on the University.

Evaluation

Up to 100 points, specifically:
For qualifications and publications, from 0 up to 60 points (42 points is the minimum score for admission to the interview)
For the interview, from 0 up to 40 points (28 point is the minimum score for passing the interview)

Selection procedure

Interviews will take place on January 19, 2023, at 10.00 CET.
The list of candidates admitted to the interview, the timetable, the venue of the interview, together with notice of any postponements, or changes in the time of the interview, will be announced on **January 12, 2023,** by means of a notice that will be published at the following link. **It is the candidate's responsibility to check the admission results and, if admitted, to show up at the required date and time.**

The interview may ascertain knowledge of the following topic:

- Tourism applications

- Destination Search Engine and Recommender Systems

- Machine learning techniques

Information and contacts

Candidates may find further details about the application process and the research project in the official call published at the following (link)
For further information please contact CESA, email: inest_pnrr@unive.it (please note that from 27/12/2022 to 02/01/2023 included, the Offices will be closed for Christmas).