Post Doctoral position

Inferring a precise geolocalization from tweets about natural disasters

Reference: 2021-1704

As France's national geological survey, the BRGM (*Bureau de recherches géologiques et minières*) is the country's leading public body when it comes to earth science, responsible for managing resources and risks relating to the earth and the subsurface (www.brgm.eu). The work carried out by the BRGM is geared towards scientific research, supporting public policies and international cooperation.

Job location:
  Country: France
  Region: Centre / Loiret
  City: Orléans

Department: Digital infrastructure and services

Start date: Spring 2021

Contract type: Postdoctoral position 18 months

Qualifications / Experience

PhD in computer science, computational social science, computational linguistics or geographic information science with knowledge in Natural Language Processing

- With less than five years of postdoctoral experience

- You need to have academic publications in related works

Context and contributions

SURICATE-Nat (www.suricatenat.fr) is a collaborative platform for the semi-automatic analysis of tweets written in French related to natural disasters (for instance, earthquakes or floods). This platform aims to exploit the testimonies immediately after a natural disaster in order to promote a rapid rise of information by «citizen sensors». This involves extracting the main information from the tweets: type of disaster, damage, location etc. Location is a particularly important piece of information as it helps the relief agencies to deal with the disaster effectively. State of the art approaches for text geolocalization often fail to provide accurate location. On the one hand, unsupervised approaches mainly rely on gazetteers, and their results directly depend on the quality of these gazetteers. On the other hand, supervised approaches suffer from too small training datasets as few tweets are geolocalized by default and they are based on partitions of the geographical space that do not meet natural disasters management needs as regards location accuracy.

The main mission of the post-doctorate fellow would therefore be to propose new approaches to improve the accuracy and the precision of the automatic geolocalization of tweets, which is a necessary step to accurately describe the effects of natural disasters.

He/she will contribute to the scientific state of the art in several fields:

- recognition, extraction and contextualization of geographic information that can be found in tweets messages (spatial named entities and spatial relationships);

- spatial named entities resolution and text geocoding, especially by enriching the analysis of the spatial named entities contained in the tweets by a contextual consideration of other available knowledge (credibility of the Twitter user, analysis of its history, but also phenomenology of natural hazards, alert notifications, sensor data, etc.).

To demonstrate the effectiveness of the proposed approaches the post-doctorate fellow will contribute to implement them on the SURICATE-Nat platform, which will give greater visibility to his/her work. He or she will also contribute to technical reports and presentations to, but not limited to, the geosciences

community. He or she will publish his/her work in scientific high impact international journals and conferences.

As part of the development of the SURICATE-Nat platform, BRGM and IGN (UMR LaSTIG) will work together. IGN (Institut National de l'Information Géographique et Forestière) is the French National Mapping Agency. It is a public state administrative institute responsible for producing and maintaining geographical information for France and its overseas departments and territories. The LaSTIG is a large geographic information sciences laboratory gathering IGN and Gustave Eiffel university researchers. The successful candidate will work in direct collaboration with researchers from both BRGM and LaSTIG laboratories, having an established expertise in geographic information extraction, spatial named entity resolution, knowledge management and machine learning.

Beyond BRGM and IGN, he/she will also have the opportunity to interact with the partners of the "RéSoCIO" ANR research project, coordinated by the BRGM and whose objective is to use Twitter for the management of natural disasters, which will make possible to promote his/her work and exchange views with a dynamic network of researchers, SMEs and stakeholders.

You will employ the following skills:

- Text mining/NLP methods (particularly Deep Learning models such as BERT and its French implementations, such as FlauBERT, camemBERT, etc.) and libraries (NLTK, Spacy, etc.)

- Very good programming skills (Python))

- Knowledge on GIS (QGIS, PostGIS and spatial SQL) and statistical analysis tools (R)

- Ability to understand questions regarding research and transfer

- Spoken and Written French and English

- Knowledge of natural hazards issues would be appreciated

Job specifics:
This research work being carried out in partnership with IGN, this full-time position involves frequent travel to Paris
In an environment conducive to work-life balance, the BRGM stands out for its friendly atmosphere.
In addition, we support the development of the careers paths of our employees, in particular through professional training.
you will receive a gross salary of € 35,000 per year.
At BRGM, you will benefit from several benefits such as 13-month remuneration, 10 weeks of vacation per year, a company restaurant, sports facilities, holiday and leisure services, etc.

Application:

To apply, send us your application (updated CV and cover letter) until March 19, 2021, through the BRGM recruitment website or by email.

- BRGM guarantees you a transparent recruitment process.

- Please note that all our positions are open to people with disabilities.

- We will review your recruitment file at the end of the broadcast period of the job offer. If your application is successful, we will contact you for recruitment interviews during which you will discuss with the hiring department, the HR department and a cross-functional department.

Keywords : NLP – NER – tweet – twitter – geolocalization – Deep Learning - GIS – Natural hazards