Chapter 15
Innovation on Geo-Enrichment of Texts Using Gazetteers for Massive Open On-Line Courses

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ABSTRACT

Text documents available in the Web contain a large amount of geographic information. For instance, forum messages posted by students in Massive Open Online Courses (MOOCs) may contain references to places. Normally, this information is not exploited, although it can be useful to further understand the topics of courses. Therefore, we propose an approach to instantly provide additional information to MOOC students about geographic features found in publications at course forums (geo-enrichment). The results are displayed through our tool, called ORBIS, which automatically highlights the geographic entities in the texts, and provides access to additional information in the same environment, without disruption; interacting with maps and spatial relationships with other entities. Information on locations mentioned in text is obtained from queries posted to the gazetteer Linked OntoGazetteer. We applied our prototype to the students' posts in the forum space for the MOOC titled Maps and the Geospatial Revolution, offered by the Pennsylvania State University.

INTRODUCTION

Massive Open Online Courses (MOOCs) are an expansion of web-based resource mainly oriented to e-learning that offer students the possibility of distance education. One of the most important features in MOOCs are the discussion forums. These forums are the only way that students can interact with the instructors, allowing them to submit their work and share their knowledge and doubts, not only with instructors, but also with other students, forming what we can call an online community. A large amount of geographic information is contained in the messages posted by students in these forums and may contain references to places, points of interest or references to historical facts. MOOCs environments (i.e. Coursera, Udacity, Udemy, etc.) apply interactive discussion forums where instructors and students can ask questions, discuss ideas, provide help to or even socialize with other students (Yang et al., 2014). Unfortunately, this information is not exploited, although it can be useful to further understand the topics of the courses.

The higher education imposes serious challenges to diverse learners including students with racially, culturally, socioeconomically, intellectually and linguistically diverse backgrounds (Moriña, 2017). Inclusive education intends to address these challenges by enhancing dynamic but equal learning opportunities for all students regardless of their background and differences (Florian, 2015)

If forums could automatically highlight the geographic entities in the texts and gets access to additional information in the same environment, without disruption, interacting with maps, demographic data, and spatial relationships with other entities, it would make it more convenient to students to get additional information about an entity and even to encourage students and decrease the number of dropouts (Yang et al., 2013).

In (Duran et al., 2014) a proposal for managing educational resources produced by three high level educational institutions is described. By taking into account not only the meta-informations inside educational resources, but also the metadata extracted from linked open data in the web associated to massive open online courses (MOOCs). Thus, authors have visualized educational resources as a semantic corporate memory where semantic technologies and Linked Open Data approaches can improve the information integration task.

On the other hand, geospatial technologies and information have become ubiquitous nowadays (Goodchild, 2006; Riihelä and Mäki, 2015). The geospatial competences required to view and manipulate spatial data and to adequately use geospatial technologies are increasingly sought after by employers (Riihelä and Mäki, 2015). Given the growing importance and recognition of these competences, Geographic Information System and Technologies (GIS&T) concepts are taught in various education frameworks: (1) Traditional on-campus education offering academic GIS degrees; (2) on-line distance learning programs leading to academic degrees and certificates (Goodchild, 2006); and (3) open, mostly non-credit, geospatial education courses aiming at making GIS, concepts and technologies, accessible and understandable to as many people as possible for free.

The number of open courses designed to introduce GIS&T concepts to learners with different professional backgrounds, age and educations has increased tremendously over the last years, such is the case of MOOCs (Belgiu et al., 2015). By using the number of clicks on videos and the participation in discussion forums as control variables, Ferschke et al. (2015) found that the participation in chats lowers the risk of dropout by approximately 50%. Another recent research suggests the most positive impact when experiencing a chat with exactly one partner rather than more or less in a MOOC (Gaurav, et al.,

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