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Dear Professor Goodchild:

I am writing to apply for participation in the Digital Gazetteer Research and Practice Workshop which will be held from December 7 through December 9, 2006. With this letter, I am also applying for financial support to cover the travel and accommodation costs, in terms as described in the open call for participation that was sent to me via the UCGIS mailing list. I am an assistant professor in geography department at the University of Georgia. My primary research in the past has focused on representing and analyzing qualitative information in GIS, which fits very well with the focuses areas of the workshop. I am really excited to see the organization of this event. It is my sincere desire to be able to contribute to and benefit from the workshop.

In the past few years, I have been envisioning the “next-generation” GISs that can georeference, integrate, and analyze qualitative geographical information. I am particularly looking at qualitative information such as place names, qualitative spatial relations (near, north, in, on etc...), and qualitative modifiers (very, a little, etc.). As human beings often have incomplete and/or inexact knowledge of the environment, it is crucial for GIS services to be receptive to qualitative inputs. Qualitative descriptions such as place names are very often used in people’s daily life, and they also exist in many text-based databases. Contemporary GISs do not make much use of them, neither can they represent or analyze them. With this envision of a new generation GIS, I started my research with the definition of a new concept, qualitative location, as “the reference of locations using their qualitative descriptions and/or qualitative spatial relations with other features” (Yao and Jiang 2005; Yao and Thill 2006). I first explored strategies to query and visualize qualitative locations in GIS. I then focused on the proximity spatial relations (such as near and far). A close examination of the qualitative spatial relations revealed the research challenges brought by two innate characteristics of the qualitative spatial relations: context-contingency and vagueness. These two characteristics are present not only in the proximity spatial relations, but also generally in many other qualitative descriptions and qualitative spatial relations. These characteristics bring about some very interesting and often unavoidable research issues when we try to interpret qualitative geographic descriptions. I have proposed two approaches, a neuro-fuzzy inference approach and a statistical approach (Yao and Thill 2005; 2007), to account for context factors in the translation/interpretation process. Particularly, the neuro-fuzzy inference approach deals with both context contingency and fuzziness.

Based on my prior studies, I am developing two research projects/ideas concerning the referencing and analysis of qualitative location information with the aid of GIS and other state-of-the-art technologies. The projects/ideas are in line with the first two focus areas as identified in the workshop call, and are marginally related to the third focus area. First,

I am working on theories and formal model(s) to define and support a so-called “qualitative georeferencing” (tentative) mechanism using place names and qualitative spatial relations. The mechanism is aimed to enable another level of georeferencing capability that will be based on the existing metric and discrete georeferencing mechanisms. This ongoing study is facing research issues from a wide array of perspectives such as ontology, semantics, context-contingency, and imprecision and fuzziness. While the challenges add more excitement to the research, I would definitely like to discuss and/or collaborate with other scholars who share similar interests. The workshop provides a valuable opportunity for that. Another related research idea in development is spatio-temporal data mining of qualitative descriptions. There are many text-based descriptions in large volume of databases and documents, data mining efforts could be very useful to identify spatio-temporal linkages, patterns, and relations among the qualitative geographic descriptions. A possible outcome of such an effort is the construction a spatio-temporal gazetteer with qualitative spatial-temporal linkages and relations established and embedded.

My passion in research on handling qualitative information in GIS and my desire to interact with other scholars stimulate my interests in the workshop. I believe that I can contribute to the discussions at the workshop. Furthermore, I am aware of the pioneer research on digital gazetteer at UCSB and the fact that this workshop is organized by the most extolled researchers in the field. It is clear to me that this workshop has a lot to offer and my research will definitely benefit tremendously from it. I anticipate that the event will provide great platform for individuals to shape/exchange ideas and for the community to advance the research along this line. I will be honored if I were accepted to participate in the workshop.

Yours Sincerely

Xiaobai Yao

P.S.

References

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