

Location-Dependent Queries in Mobile Contexts: Distributed Processing Using Mobile Agents

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Abstract of the Article

With the current advances of mobile computing technology, we are witnessing an explosion in the development of applications that provide mobile users with a wide range of services. In this paper we present a system that supports distributed processing of continuous location-dependent queries in mobile environments. The system that we propose presents the following main advantages: 1) it is a general solution for the processing of location-dependent queries in scenarios where not only the users issuing queries but also other interesting objects can move; 2) it performs an efficient processing of these queries in a continuous way; 3) it is specially well adapted to environments where location data are distributed in a network and processing tasks can be performed in parallel, allowing a high scalability; and 4) it optimizes wireless communications. We use mobile agents to carry the processing tasks wherever they are needed. Thus, agents are in charge of tracking the location of interesting moving objects and refreshing the answer to a query efficiently. We evaluate the usefulness of the presented proposal showing that the system achieves a good precision and scales up well.

1 Publication Data

The article¹ was published in the international journal *IEEE Transactions on Mobile Computing* (ISSN 1536-1233), which has an impact factor of 3.034 and is the number 1 in the category of Telecommunications and the number 5 in Computer Science/Information Systems, according to the last edition of the Journal Citation Report (JCR 2005). Our contribution was the featured article in the electronic version of the number of August 2006.

The article presents the core of our project LOQOMOTION. We have identified at least 20 references to such a project (from several works by at least 11 research groups, including 3 journals indexed in the JCR, 2 PhD dissertations, and relevant conferences in the field such as MDM or ICDE), leaving aside references from web pages. Most references do not point specifically to this article, but that is probably due only to its recent publication. For example, we have identified a very recent reference in the ICDE'07 conference. Moreover, this article is one of the readings for the course CS 589 Software Engineering for Embedded Systems (http://csse.usc.edu/classes/cs589_2006/) at the USC Viterbi School of Engineering at the University of South California (Los Angeles, USA).

¹Available at <http://sid.cps.unizar.es/PUBLICATIONS/POSTSCRIPTS/h1029.pdf.gz>.