Guest Editorial: Special Section on Query Models and Efficient Selection of Web Services

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Service-oriented computing is gaining momentum as the next technological vehicle to leverage the huge investments in web application development. Web services are poised to take center stage as part of this adoption [4]. The ever-increasing number of web services will have the effect of transforming the web from a data-oriented repository to a service-oriented repository, also known as the Service Web [1]. In this new paradigm, existing business logic would be wrapped as web services to be accessible on the web via a web services middleware [2]. As the number of web services is expected to substantially increase, this would have the effect of introducing competition among web services that offer similar functionalities. Service users are enabled to select the “best” web services and/or their combinations with respect to their expected quality, such as price, response time, and reputation.

There is a need to provide a sound framework to organize web services. This would form as a platform to query web services. Building this framework is especially important due to the ever-increasing large and heterogeneous web service deployment. A key ingredient of such a service framework is a formal service query model that can capture the key features of services to filter interactions and accelerate service searches. The query models must be congruent with the dynamic, active, autonomous, and highly heterogeneous nature of web services and their environment. Query languages and efficient selection techniques can then be developed once such a service model is in place.

Existing service discovery technologies, such as service registries and service search engines, mainly support the simple keyword-based search on web services. However, keyword search cannot always precisely locate web services, partially because of the rich semantics embodied in these services. Due to the ambiguity of the keywords, which are typically described using natural language, either too many irrelevant services may be returned or some highly relevant services may be missed. As a key facilitator for application outsourcing, a common usage pattern of service-oriented computing, most of the irrelevant services in the first case and the highly relevant services in the second case, are enabled to select the “best” web services and/or their combinations with respect to their expected quality, such as price, response time, and reputation.

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given domain. Query rewriting algorithms are proposed to automatically transform a user’s query into a composition of data-providing services. The article by Guinard et al., “Interacting with the SOA-Based Internet of Things: Discovery, Query, Selection, and On-Demand Provisioning of Web Services,” addresses the issue of service discovery and on-demand provisioning of missing functionalities in an environment that is composed of a large number of networked and resource-limited devices. It proposes a Real-World Service Discovery and Provisioning Process (RSDPP) to help developers discover real world services running on embedded devices, which are in turn included in composite applications.

We would like to thank all of the authors for submitting their latest research results to this special section. We are also grateful to the reviewers for their insightful and thoughtful reviews.

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References


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Athman Bouguettaya received the PhD degree in computer science from the University of Colorado at Boulder in 1992. He is a science leader at the CSIRO ICT Centre, Canberra. He was previously a tenured faculty member in the Computer Science Department at Virginia Polytechnic Institute and State University (Virginia Tech). He currently holds adjunct professorships at the Australian National University, Canberra, the University of Queensland, Brisbane, Australia, the University of New South Wales, Sydney Australia, and Macquarie University, Sydney, Australia. He is on the editorial boards of several journals, including the International Journal on Very Large Data Bases (VLDB Journal), the Distributed and Parallel Databases Journal, the International Journal of Cooperative Information Systems, and the IEEE Transactions on Services Computing. He guest edited the IEEE Internet Computing special issue on database technology on the web and the ACM Transactions on the Internet special issue on Semantic Web services. He served as the program chair of the 2008 International Conference on Service Oriented Computing (ICSOC 2008), the 20th Australasian Database Conference (ADC 2009), and the IEEE RIDE Workshop on Web Services for E-Commerce and E-Government (RIDE-WS-ECEG 2004). He has published more than 130 articles in journals and conferences in the area of databases and service computing (e.g., the IEEE Transactions on Knowledge and Data Engineering, the ACM Transactions on the Web, VLDB Journal, SIGMOD, ICDE, VLDB, and EDBT). His current research interests are in the foundations of web service management systems. He is a fellow of the IEEE and a senior member of the ACM.