Scientific Programming

Special Issue on
Scientific Programming in the Fog and Edge Computing Era

CALL FOR PAPERS

Despite computing being focused around centralized cloud infrastructures in the past two decades, the Internet of Things (IoT)—and the huge amount of data it generates—is currently inverting this trend, shifting computing power back to where data is generated from. The key challenges that arise are twofold: small-sized information needs to be extracted out of gigabytes of raw data on local devices to avoid wasting bandwidth and raw data needs to be transmitted to the Cloud quickly enough to take appropriate actions in time.

For example, portable sequencing machines can be used to obtain genomic sequences, providing essential information to trace back the history of organisms present in the environment. Geospatial info-mobility systems analyze recent location information shared by vehicles to detect traffic issues and then use these patterns to notify users and take local routing decisions. Furthermore, smart surveillance applications support police ocers by displaying video streams on their smartphones that show suspicious people or behavior nearby.

This trend is supported by a new generation of powerful, less power-hungry processors. However, existing programming models have been designed for traditional Internet applications—not for scenarios that present a huge number of heterogeneous devices unpredictably moving in the environment. Therefore, this paradigm shift towards a decentralized model requires an equivalent shift in software engineering environments, tools, languages, and models of computation for scientific programming.

This special issue aims to publish original research articles and review articles on scientific programming in the broad area of Fog and Edge computing.

Potential topics include but are not limited to the following:

- Novel Fog/Edge-based scientific programming

- Programming models, paradigms and tools for Fog/Edge scientific computing

- Parallel computing applied to Fog/Edge scientific computing infrastructures

- Storage and data management approaches for Fog/Edge scientific programming

- Security Architectures for communications applied to Fog/Edge functional programming

- Multiaccess Edge Computing (MEC) architectures for scientific programming applications

- 5G communications between Fog/Edge applications and IoT platforms for use in scientific programming

- Data integration for Fog/Edge scientific programming applications using IoT solutions

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/sp/spefc/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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