



Special Issue on Multi-tier Big Data Pipelines from Edge to the Cloud Data Centers

Software: Practice and Experience (Wiley Press)

Call for Papers

Today, huge amount of data is being generated by the Internet of Things (IoT), such as smartphones, sensors, cameras, cars and robots. In order to process the generated data, there exist Big Data platforms (such as Hadoop and Spark). Conventionally, they are deployed in centralised Data Centers, which, however, fails short of addressing time-critical requirements of the applications due to high latency between the Edge, where the data are generated and the Data Centers where they are processed. The emerging Edge/Fog computing paradigm promises to solve this problem by seamlessly integrating hardware and software resources across multiple computing tiers, from the Edge to the Data Center/Cloud. Since computing resources at the Edge may be power and capacity constrained, it is necessary to invent new lightweight platforms and techniques that seamlessly interact, sense, execute and produce results with very low latency, while at the same time address other high-level requirements of applications, such as security and privacy. Regarding these problems there are many challenges that must be addressed with the invention of new architectures, methods, algorithms and solutions.

The aim of the Special Issue is to report the state-of-the-art research on Multi-tier Big Data Pipelines in integrated Edge/Fog and Cloud Data centers environments. This is an open call for contributions. Our intention is to discuss various problems, challenges, new approaches and technologies addressing this hot new area of research. The idea is to shortlist the most challenging problems, to shape future directions for research, foster the exchange of ideas, standards and common requirements. We look for high quality work that addresses various aspects of the investigated problem. Topics of interest include but are not limited to:

- Integrate and process data from underlying IoT platforms and services
- Smartly select data streams for processing
- Address the 4 “V” of the Big Data problem: volume, variety, velocity and veracity
- Improve the energy efficient management of resources and tasks processing
- Address the QoS and time-critical aspects of smart applications
- Facilitate intelligent integration of information arising from various sources

- Address the requirements of very dynamic Big Data pipelines (e.g. moving smartphones, sensors, cars, robots with dynamically changing requirements for processing)
- Provide orchestration methods and scheduling policies that address dependability, reliability, availability and other high-level application requirements
- Adequately address the inherent variability of resources from the Edge to the Data Centers
- Provide new architectures which use the powerful computing resources of Data Centers, while at the same time providing optimal QoS to applications
- Address the decentralisation aspects through the use of Blockchain-based Smart Contracts and Oracles
- Implement distributed Artificial Intelligence methods from the Edge to the Data Center/Cloud

Important Dates

Feb 28, 2020 - Paper submission due

April 15, 2020 - First round evaluation notification

Jun 15, 2020 - Revision submission due

Jul 15, 2020 - Paper acceptance/rejection notification

Oct 15, 2020 - Special Issue

Special Issue Paper Submission

This special issue seeks submission of papers that present novel and innovative ideas. It also welcomes submissions of Extended high quality papers following the **Big Data Pipelines-2019** workshop (<https://hipc.org/bigdata/>), which is organised in conjunction with the *26th IEEE International Conference on High Performance Computing, Data, and Analytics (HiPC)*, 17-20 December 2019, Hyderabad, India may also be considered for publication. All submissions including invited papers go under regular peer review process.

The guest editorial board members cover broad expertise from the areas of Edge and Fog computing, High Performance Computing, Cloud computing, decentralised/distributed Artificial Intelligence, orchestration and scheduling, Blockchain and others.

We seek submission of papers that present new, original and innovative ideas for the "first" time in SPE. Submission of "extended versions" of already published works (e.g., conference papers) is not encouraged unless they contain a significant number of "new and original" ideas/contributions along with more than 50% brand "new" material.

If you are submitting an extended version, you must submit a cover letter/document detailing (1) the "Summary of Differences" between the SPE paper and the earlier paper, (2) a clear list of "new and original" ideas/contributions in the SPE paper (identifying sections where they are proposed/presented), and (3) confirming the percentage of new material. Otherwise, the submission will be "desk" rejected without being reviewed.

While submitting paper to this issue, please select "SPE-SI-BigDataPipelines" in the submission system.

Regular Issue Submission

"If you have a paper on cloud computing which does not match the requirements of the Special Issue, we encourage you to submit it as a regular paper to Software: Practice and Experience. The journal has expanded its coverage to specifically include cloud computing."

Guest Editors

Vlado Stankovski

Distributed and Cloud Computing
University of Ljubljana, Slovenia
Email: vlado.stankovski@fgg.uni-lj.si

Rajkumar Buyya

Cloud Computing and Distributed Systems (CLOUDS) Laboratory,
University of Melbourne, Australia
Email: rbuyya@unimelb.edu.au

Shrideep Pallickara

Department of Computer Science
Colorado State University, USA
Email - shrideep@cs.colostate.edu

Shashikant Ilager

Cloud Computing and Distributed Systems (CLOUDS) Laboratory,
University of Melbourne, Australia
Email - silager@student.unimelb.edu.au