VOL 8, NO 2 (2021) "**Advance Methods and Technologies on Vector Computing and Data-Processing Using NEC SX-Aurora TSUBASA Architecture**"

Submission Deadline: 15 June 2021

Vector data-processing has been introduced into high-performance computing in the early 70s, and today vector technology is widely adopted in modern multicore central processors and accelerators, such as GPUs. In particular this fully applies to vector supercomputers developed by the NEC company, which has been producing a family of vector machines since 1983 and nowadays continues to develop this line. SX-Aurora TSUBASA is the most recent generation of NEC's supercomputer having vector processors. The vector processor is implemented onto a PCIe card as Vector Engine (VE) and it works on an x86/Linux environment. The VE processor uses a combination of powerful vector cores and high-bandwidth memory and it executes whole application code on VE with avoiding frequent transactions between VE and X86 host processors. This allows NEC SX-Aurora TSUBASA architecture to achieve high sustained performance even in applications that require high memory performance, which significantly extends the class of problems, suitable for this architecture. More than 18 thousands VE cards of the SX-Aurora TSUBASA supercomputer have been shipped worldwide and those are contributing a lot of scientific fields such as meteorology, resource exploration, CFD, chemistry, natural disaster prevention/mitigation, etc.

The objective of this special issue is to allow researches working with NEC SX-Aurora TSUBASA vector architecture to present and discuss methodologies, approaches and solutions of using the potential of vector data-processing both for the design of promising high-performance computing systems and for development of various classes of applications.

This Special Issue on **Advance Methods and Technologies on Vector Computing and Data-Processing Using NEC SX-Aurora TSUBASA Architecture** (#2, 2021) of the scientific journal "Supercomputing Frontiers and Innovations" (indexed at ACM Digital Library and Scopus) is an open call for contributions seeking original, unpublished papers that present scientific contributions in the field of high-performance vector computing.

Topics of interest include, but are not limited to:

- Developing scientific programs and real applications for the NEC SX-Aurora TSUBASA architecture.
- Porting existing programs and program packages to the NEC SX-Aurora TSUBASA architecture: methodology, practice and experience.
- Performance optimization and performance evaluation techniques for vector programs.
- Development of tools and frameworks aimed for the performance and efficiency analysis of vector programs.
- Development of promising next generations of high-performance vector computing systems.
- Solving problems in various areas of science, technology and engineering using NEC SX-Aurora TSUBASA architecture.
- Adapting conventional algorithms for efficient vector computing.

A paper is 10–16 pages long and presents the results of a completed scientific study. All articles will be peer reviewed and accepted based on quality, originality, novelty, and relevance to the special issue. Contributions should be written in good English and must meet Supercomputing Frontiers and Innovations standards. Please prepare your article according to the Author Guidelines before submitting a manuscript. Use JSFI's system to submit your manuscripts online (registration in the system).

Guest Editor:
Hiroaki Kobayashi, Prof. of Graduate School of information Sciences, Tohoku University.

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