9th Workshop on Parallel/High-performance Object-oriented Scientific Computing

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Abstract

Categories and Subject Descriptors I [*I.0*]

General Terms Languages, Performance

Keywords object oriented, parallel computing, scientific computing

1. Main Theme and Goals

While object-oriented programming has been embraced in industry, particularly in the form of C++, Java, and Python, its acceptance by the parallel scientific programming community has been relatively slow. Nonetheless, various factors practically dictate the use of language features that provide higher level abstractions than do C or older FORTRAN standards. These include increasingly complex physics models, numerical algorithms, and hardware, e.g. deep memory hierarchies, ever-increasing numbers of processors, the advent of multi-core processors; more recently the use of heterogeneous architectures using the IBM Cell/BE or GP-GPUs, and soon the experimentation with many-core processors.

Challenges in scientific computing include scalability, performance, domain decomposition, scheduling, memory management, coupling large codes, load balancing, exploiting computational accelerators, and others that can benefit from OO abstraction.

Our goal is to bring researchers ‘out of the woodwork’ to present their latest and greatest innovations and developments in exploiting object-oriented abstraction in parallel high-performance scientific computing to a like-minded, inquisitive audience of peers. The emphasis is on how object-oriented programming can benefit scientific computing specifically: new or novel frameworks, approaches, techniques, or idioms that use object orientation. Multi-paradigmatic approaches are also of definite interest. Presentations of work in progress are welcome. In previous POOSC workshops have had participants whose primary purpose was to get feedback on their nascent research ideas; we regard this as an ideal use of the workshop format.

Specific areas of interest include, but are not limited to,

- alternatives or extensions, including multi-paradigmatic approaches, to mainstream object-oriented languages (e.g. C++, Java, Python);
- performance issues and their realized or proposed resolution;
- issues specific to handling or abstracting parallelism, including the handling or abstraction of heterogeneous, multicore, or accelerated microarchitectures;
- higher level languages (e.g. domain specific languages) or their embedding into OO languages to support parallelism or specific tasks in scientific computing;
- frameworks and tools for object-oriented scientific computing;
- proposed or realized solutions to problems hindering acceptance of object-oriented scientific computing;
- position papers and grand visions (of relevance).

The workshop will consist of a sequences of presentations each followed by a discussion session. The workshop will conclude with an overall discussion. We expect the majority of the participants to give presentations.

Full papers are not required for acceptance/presentation, but they are strongly encouraged.

For authors of accepted presentations who require justification for travel the organizers can provide official letters of invitation.

SPLASH'10, October 17–21, 2010, Reno/Tahoe, Nevada, USA.
ACM 978-1-4503-0240-1/10/10.