

SS4: Networks for Intensive Computing and Massive Storage Applications in Biology, Genetics, and Genomics

■ Call for Papers

The research topics that have recently gained momentum in the fields of biological sciences have shown the great potentials and benefits achievable by involving advanced networking, storage, and computing techniques in a cloud fashion. For example, the reductions in DNA sequencing costs is faster than the Moore's law. The currently observed consequence is a very fast increase of the use of genomic data sets and processing software packages in research and medical activities.

It is a common belief that soon doctors and biologists will require cloud services from thousands of hospitals and research centers. Just to give an idea of the significance of the problem, assume that a researcher wants to determine the genome fingerprint of a disease spread over different countries. Not only the number of available genome files is becoming extremely large, but also each individual data set is significantly large, in the order of tens of GB. This problem is referred to as *Big²data* problem. For example, the Beijing Genomics Institute, which produces 2,000 human genomes a day, instead of transmitting them through the Internet or other networks, must send computer hard disks containing the data via express courier¹. Therefore, it is necessary to design and deploy novel network architectures capable of supporting the challenging increase of traffic demand.

A further interdisciplinary, recently developed, area of research is the biological nano-networking. In order to cope with billions of nano-particles interacting within a biological environment, a number of specialized design and simulation software tools have been introduced. They are very high computational intensive, multi thread, and distributed packages which have very stringent network performance requirements.

Given this background, the aim of the special session is to collect original contributions on the latest research achievements on data networking research targeting cloud computing services for biological sciences. Topics of interest include, but are not limited to:

- Novel distributed storage technologies for biological big data.
- QoE management for genetic and genomic data delivery.
- Distributed computing technologies to process biological big data.
- Visualization technologies for expressing biological nano-objects.
- Novel networked tools and services for bioinformatics.
- Mapping bioinformatics requirements onto network specifications.
- Security, privacy, and ethical issues in delivering biological data.

¹<http://www.nytimes.com/2011/12/01/business/dna-sequencing-caught-in-deluge-of-data.html>

- Data delivery techniques for sharing molecular nano-network experimental results.
- Grid-enabled software tools for simulating and designing nano-networks.
- Genomic, genetic, and biological data ontology for distributed storage.
- Biological-data-centric management of data centers.
- Network and service virtualization for data management in biological sciences.

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■ Important dates

Paper Submission: July 3, 2014 (Extended)

Notification of Acceptance: August 1, 2014

Final Paper: August 15, 2014

Submit online at [EDAS website](#) »

■ Session organizers

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²<http://conan.diei.unipg.it/lab/index.php/research-ares>