Cloud computing is still growing by leaps and bounds and is likely to be used in all major server centers in future. This will be driven by both the low cost and rich features of clouds. It is hard to see how traditional institutional data centers can compete except for specialized services such as supercomputing or real-time response to nearby components of the Internet of things. Progress in clouds comes from both the commercial and research communities and their collaboration. This timely book addresses many critical open topics that can be divided into three areas:

1. Programming model, infrastructure, and runtime
2. Resource management
3. Security

The Programming model, infrastructure, and runtime chapters include a futuristic chapter on serverless computing -- one of the most promising cloud topics covering microservices, event-based execution, and the FaaS Function as a Service model. Other chapters cover high availability, simulation, classification, migration and virtual network performance. High-Performance Computing in Big Data and streaming issues are considered.

The Resource management chapters cover resource scheduling including VM placement and use of gaming techniques for pricing and allocation. The important broad topics of auto-scaling and energy management are covered thoroughly.

The Security chapters cover broad topics including interoperability, access control, use of trusted computers and the important special issues raised by containers. A major application focus is healthcare. Forensic analysis of intrusion events is a fascinating topic.

The value of the book can be measured by the interest of the topics and the quality of the chapter authors. However, a key measure is the credentials of the editors who have put together this magnificent collection. The expertise of the editors covers the three areas as seen in their brief research descriptions below.

Sanjay Chaudhary has made significant contributions in the cloud resource management and allocation methods. Sanjay brings a vast research experience in working on various issues related to cloud infrastructure, performance, SaaS application development, application migration and workflow scheduling in cloud computing environments. Sanjay also brings a rich experience of working with Grid computing systems which has helped him in contributing to various resource managements aspects of cloud computing.

Gaurav Somani has worked on multiple aspects of cloud computing domain such as resource management, metering, verification and accounting and a number of security issues. Gaurav has made a number of significant contributions in the area of attack mitigation and recovery in cloud computing. VM backup, secure deduplication, performance isolation and DDoS attack prevention are few important research problems he has addressed in the recent past.

Rajkumar Buyya has a very rich experience of developing production-level systems related to cloud computing and grid computing systems. He has made significant contributions in terms of highly cited papers related to the software systems related to overall management of cloud resources. Raj and his group have developed two popular software packages, Aneka and CloudSim which are for cloud computing research and production usages.

I commend the book “Research Advances in Cloud Computing” to all computing professionals. Read and Enjoy!

Geoffrey Fox, Bloomington IN USA; 10 May 2019

Chair, Intelligent Systems Engineering, School of Informatics and Computing

Distinguished Professor of Computing, Engineering, and Physics

Director of the Digital Science Center, Indiana University – Bloomington

Email: gcf@indiana.edu