

# **2019 19th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGRID 2019)**

**Larnaca, Cyprus  
14 – 17 May 2019**



**IEEE Catalog Number: CFP19276-POD  
ISBN: 978-1-7281-0913-8**

**Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc.  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP19276-POD
ISBN (Print-On-Demand):	978-1-7281-0913-8
ISBN (Online):	978-1-7281-0912-1

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# 2019 19th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGRID) **CCGRID 2019**

## Table of Contents

Welcome from the General Chairs .xv.....	
Welcome from the Program Chairs .xvi.....	
Welcome Message from the CCGRID 2019 Workshop/Tutorial Chairs .xviii.....	
CCGrid 2019 Committees .xx.....	
Keynotes .xxx.....	

## CCGrid 2019: The 19th Annual IEEE/ACM International Symposium in Cluster, Cloud, and Grid Computing

### Scheduling and Resource Management I

One Can Only Gain by Replacing EASY Backfilling: A Simple Scheduling Policies Case Study .1.....	
<i>Danilo Carastan-Santos (Univ. Grenoble Alpes, CNRS, Inria, Grenoble INP, LIG), Raphael Y. De Camargo (Federal University of ABC), Denis Trystram (Univ. Grenoble Alpes, CNRS, Inria, Grenoble INP, LIG), and Salah Zrigui (Univ. Grenoble Alpes, CNRS, Inria, Grenoble INP, LIG)</i>	
NBBS: A Non-Blocking Buddy System for Multi-core Machines .11.....	
<i>Romolo Marotta (University of Rome La Sapienza, Italy), Mauro Ianni (University of Rome La Sapienza, Italy), Andrea Scarselli (University of Rome La Sapienza, Italy), Alessandro Pellegrini (University of Rome La Sapienza, Italy), and Francesco Quaglia (University of Rome Tor Vergata, Italy)</i>	
Optimizing Performance and Computing Resource Management of In-memory Big Data Analytics with Disaggregated Persistent Memory .21.....	
<i>Shouwei Chen (Rutgers University), Wensheng Wang (JD.com Inc.), Xueyang Wu (JD.com Inc.), Zhen Fan (JD.com Inc.), Kunwu Huang (MemVerge Inc.), Peiyu Zhuang (MemVerge Inc.), Yue Li (MemVerge Inc.), Ivan Rodero (Rutgers University), Manish Parashar (Rutgers University), and Dennis Weng (JD.com)</i>	

## Programming Models and Runtime Systems I

- Detection of Silent Data Corruptions in Smoothed Particle Hydrodynamics Simulations .31.....  
*Aurelien Cavelan (University of Basel), Rubén M. Cabezón (University of Basel), and Florina M. Ciorba (University of Basel)*
- EC-Shuffle: Dynamic Erasure Coding Optimization for Efficient and Reliable Shuffle in Spark .41.....  
*Xin Yao (The University of Hong Kong), Cho-Li Wang (The University of Hong Kong), and Mingzhe Zhang (The University of Hong Kong)*
- Application-Level Differential Checkpointing for HPC Applications with Dynamic Datasets .52.....  
*Kai Keller (Barcelona Supercomputing Center) and Leonardo Bautista-Gomez (Barcelona Supercomputing Center)*

## SCALE Challenge

- Million-Core-Scalable Simulation of the Elastic Migration Algorithm on Sunway TaihuLight Supercomputer .62.....  
*Lin Gan (Tsinghua University), Jingheng Xu (Tsinghua University), Xin Wang (Tsinghua University), Sihai Wu (National Supercomputing Center in Wuxi), Xiaohui Duan (Shandong University), Yuxuan Li (Tsinghua University), Haohuan Fu (Tsinghua University), and Guangwen Yang (Tsinghua University)*
- Scalable Video Transcoding in Public Clouds .70.....  
*Qingye Jiang (The University of Sydney), Young Choon Lee (Macquarie University), and Albert Y. Zomaya (The University of Sydney)*
- Dynamic Scaling of Video Analytics for Wide-Area Tracking in Urban Spaces .76.....  
*Aakash Khochare (Indian Institute of Science), Sheshadri K.R. (Indian Institute of Science), Shriram R. (Indian Institute of Science), and Yogesh Simmhan (Indian Institute of Science)*

## Storage and I/O Systems

- An Intelligent, Adaptive, and Flexible Data Compression Framework .82.....  
*Hariharan Devarajan (Illinois Institute of Technology), Anthony Kougkas (Illinois Institute of Technology), and Xian-He Sun (Illinois Institute of Technology)*
- ePipe: Near Real-Time Polyglot Persistence of HopsFS Metadata .92.....  
*Mahmoud Ismail (KTH - Royal Institute of Technology), Mikael Ronström (Oracle), Seif Haridi (KTH - Royal Institute of Technology), and Jim Dowling (KTH - Royal Institute of Technology)*
- A Zoom-in Analysis of I/O Logs to Detect Root Causes of I/O Performance Bottlenecks .102.....  
*Teng Wang (Lawrence Berkeley National Laboratory), Suren Byna (Lawrence Berkeley National Laboratory), Glenn K. Lockwood (Lawrence Berkeley National Laboratory), Shane Snyder (Argonne National Laboratory), Philip Carns (Argonne National Laboratory), Sunggon Kim (Seoul National University), and Nicholas J. Wright (Lawrence Berkeley National Laboratory)*

Lamda-Flow: Automatic Pushdown of Dataflow Operators Close to the Data .112.....	
	<i>Raúl Gracia-Tinedo (Universitat Rovira i Virgili), Marc Sánchez-Artigas (Universitat Rovira i Virgili), Pedro Garcia-López (Universitat Rovira i Virgili), Yosef Moatti (IBM Research), and Filip Gluszak (GridPocket)</i>

## Performance Modeling and Evaluation

Data Transfer between Scientific Facilities – Bottleneck Analysis, Insights and Optimizations .122.....	
	<i>Yuanlai Liu (University of California, Riverside), Zhengchun Liu (The University of Chicago and Argonne National Laboratory), Rajkumar Kettimuthu (Argonne National Laboratory), Nageswara Rao (Oak Ridge National Laboratory), Zizhong Chen (University of California, Riverside), and Ian Foster (The University of Chicago)</i>
Is it Worth Relaxing Fault Tolerance to Speed Up Decommission in Distributed Storage Systems? .132.....	
	<i>Nathanaël Cherie (Univ. Rennes, Inria, CNRS, IRISA), Matthieu Dorier (Argonne National Laboratory), and Gabriel Antoniu (Univ. Rennes, Inria, CNRS, IRISA)</i>
Visual Performance Analysis of Memory Behavior in a Task-Based Runtime on Hybrid Platforms .142.....	
	<i>Lucas Leandro Nesi (Institute of Informatics/PPGC/UFRGS), Samuel Thibault (Inria Bordeaux Sud-Ouest), Luka Stanisic (Max Planck Computing and Data Facility), and Lucas Mello Schnorr (Institute of Informatics/PPGC/UFRGS)</i>
Autotuning Under Tight Budget Constraints: A Transparent Design of Experiments Approach .147.....	
	<i>Pedro Bruel (University of Grenoble Alpes, CNRS, Inria and University of São Paulo), Steven Qunito Masnada (University of Grenoble Alpes, Inria, CNRS), Brice Videau (University of Grenoble Alpes, CNRS, Inria), Arnaud Legrand (University of Grenoble Alpes, CNRS, Inria), Jean-Marc Vincent (University of Grenoble Alpes, CNRS, Inria), and Alfredo Goldman (University of São Paulo)</i>

## Doctoral Symposium

BOOTABLE: Bioinformatics Benchmark Tool Suite .157.....	
	<i>Maximilian Hanussek (University of Tübingen), Felix Bartusch (University of Tübingen), Jens Krüger (University of Tübingen), and Oliver Kohlbacher (University of Tübingen)</i>
Reproducible Scientific Workflows for High Performance and Cloud Computing .161.....	
	<i>Felix Bartusch (University of Tübingen), Maximilian Hanussek (University of Tübingen), Jens Krüger (University of Tübingen), and Oliver Kohlbacher (University of Tübingen)</i>
Mobile Smart-Contract Lifecycle Governance with Incentivized Proof-of-Stake for Oligopoly-Formation Prevention .165.....	
	<i>Vipin Deval (Tallinn University of Technology (TalTech), Tallinn, Estonia) and Alex Norta (Tallinn University of Technology (TalTech), Tallinn, Estonia)</i>
Towards Efficient Solvers for Optimisation Problems .169.....	
	<i>Huu-Phuc Vo (Uppsala University)</i>

A Performance Driven Micro Services-Based Architecture/System for Analyzing Noisy IoT Data .173.....  
*Miodrag Bolic (Univeristy of Ottawa) and Shikharesh Majumdar (Carleton University)*

## Cloud Computing I

A Preliminary Fault Taxonomy for Multi-tenant SaaS Systems .178.....  
*Victor Hugo Santiago C. Pinto (University of São Paulo (ICMC-USP)), Simone R. S. Souza (University of São Paulo (ICMC-USP)), and Paulo S. L. Souza (University of São Paulo (ICMC-USP))*

Towards Enabling Dynamic Resource Estimation and Correction for Improving Utilization in an Apache Mesos Cloud Environment .188.....  
*Gourav Rattihalli (State University of New York at Binghamton), Madhusudhan Govindaraju (State University of New York at Binghamton), and Devesh Tiwari (Northeastern University)*

DMC: A Differential Marketplace for Cloud Resources .198.....  
*Abhinandan S. Prasad (University of Goettingen, Germany, National Institute of Engineering Mysuru, India), Mayutan Arumathurai (University of Goettingen, Germany), David Koll (University of Goettingen, Germany, Continental AG, Germany), and Xiaoming Fu (University of Goettingen, Germany)*

## Architecture & Networking I

Fuzzy Matching: Hardware Accelerated MPI Communication Middleware .210.....  
*Matthew G. F. Dosanjh (Sandia National Laboratories), Whit Schonbein (Sandia National Laboratories), Ryan E. Grant (Sandia National Laboratories), Patrick G. Bridges (University of New Mexico), S. Mahdieh Gazimirsaeed (Queen's University), and Ahmad Afsahi (Queen's University)*

Efficient Congestion Management for High-Speed Interconnects using Adaptive Routing .221.....  
*Jose Rocher-Gonzalez (University of Castilla-La Mancha), Jesus Escudero-Sahuquillo (University of Castilla-La Mancha), Pedro J. García (University of Castilla-La Mancha), Fransico J. Quiles (University of Castilla-La Mancha), and Gaspar Mora (Intel Corporation)*

Batched Sparse Matrix Multiplication for Accelerating Graph Convolutional Networks .231.....  
*Yusuke Nagasaka (Tokyo Institute of Technology), Akira Nukada (Tokyo Institute of Technology), Ryosuke Kojima (Kyoto University), and Satoshi Matsuoka (RIKEN Center for Computational Science)*

## Autonomic Computing, Datacenters, and Cyberinfrastructure

Anomaly Detection and Classification using Distributed Tracing and Deep Learning .241.....  
*Sasho Nedelkoski (TU Berlin), Jorge Cardoso (Huawei Technologies, Munich), and Odej Kao (TU Berlin)*

Missing Data Recovery in Large-Scale, Sparse Datacenter Traces: An Alibaba Case Study .251.....	
<i>Yi Liang (Beijing University of Technology), Linfeng Bi (Beijing University of Technology), and Xing Su (Beijing University of Technology)</i>	
Towards Securing Data Transfers Against Silent Data Corruption .262.....	
<i>Batyr Charyyev (University of Nevada, Reno), Ahmed Alhussen (University of Nevada, Reno), Hemanta Sapkota (University of Nevada, Reno), Eric Pouyoul (Lawrence Berkeley National Lab), Mehmet Hadi Gunes (University of Nevada, Reno), and Engin Arslan (University of Nevada, Reno)</i>	

## Cloud Computing II

Game Theoretic-Based Approaches for Cybersecurity-Aware Virtual Machine Placement in Public Cloud Clusters .272.....	
<i>Soamar Homsî (Florida International University), Gang Quan (Florida International University), Wujie Wen (Florida International University), Gustavo A. Chapparó-Baquero (Florida International University), and Laurent Njilla (Air Force Research Laboratory)</i>	
Beyond Load Balancing: Package-Aware Scheduling for Serverless Platforms .282.....	
<i>Gabriel Aumala (Escuela Superior Politécnica del Litoral, ESPOL), Edwin Boza (Escuela Superior Politécnica del Litoral, ESPOL), Luis Ortiz-Avilés (Escuela Superior Politécnica del Litoral, ESPOL), Gustavo Totoy (Escuela Superior Politécnica del Litoral, ESPOL), and Cristina Abad (Escuela Superior Politécnica del Litoral, ESPOL)</i>	
SMR-X: Flexible Parallel State Machine Replication for Cloud Computing .292.....	
<i>Meng Zhou (Sun Yat-Sen University), Weigang Wu (Sun Yat-Sen University), Zhiguang Chen (Sun Yat-Sen University), and Nong Xiao (Sun Yat-Sen University)</i>	

## Scheduling and Resource Management II

Exploiting CPU Voltage Margins to Increase the Profit of Cloud Infrastructure Providers .302.....	
<i>Christos Kalogirou (University of Thessaly), Panos Koutsovasilis (University of Thessaly), Christos D. Antonopoulos (University of Thessaly), Nikolaos Bellas (University of Thessaly), Spyros Lalis (University of Thessaly), Srikumar Venugopal (IBM Research), and Christian Pinto (IBM Research)</i>	
CRAM: a Container Resource Allocation Mechanism for Big Data Streaming Applications .312.....	
<i>Olubisi Runsewe (University of Ottawa) and Nancy Samaan (University of Ottawa)</i>	
Efficient Job Scheduling for Clusters with Shared Tiered Storage .321.....	
<i>Leah E. Lackner (Technische Universität Darmstadt), Hamid Mohammadi Fard (Technische Universität Darmstadt), and Felix Wolf (Technische Universität Darmstadt)</i>	

On the Cost of Acking in Data Stream Processing Systems .331.....  
*Alessio Pagliari (Université Côte d'Azur, CNRS, I3S), Fabrice Huet (Université Côte d'Azur, CNRS, I3S), and Guillaume Urvoy-Keller (Université Côte d'Azur, CNRS, I3S)*

## **Programming Models and Runtime Systems II**

Multivariate LSTM-Based Location-Aware Workload Prediction for Edge Data Centers .341.....  
*Chanh Nguyen (Umeå Univeristy), Cristian Klein (Umeå University), and Erik Elmroth (Umeå University)*

DCA-IO: A Dynamic I/O Control Scheme for Parallel and Distributed File Systems .351.....  
*Sunggon Kim (Seoul National University), Alex Sim (Lawrence Berkeley National Laboratory), Kesheng Wu (Lawrence Berkeley National Laboratory), Suren Byna (Lawrence Berkeley National Laboratory), Teng Wang (Lawrence Berkeley National Laboratory), Yongseok Son (Chung-Ang University), and Hyeonsang Eom (Seoul National University)*

A Machine Learning Approach for Productive Data Locality Exploitation in Parallel Computing Systems .361..  
*Engin Kayraklioglu (The George Washington University), Erwan Favry (The George Washington University), and Tarek El-Ghazawi (The George Washington University)*

Scalability of the NewMadeleine Communication Library for Large Numbers of MPI Point-to-Point Requests .371.....  
*Alexandre Denis (Inria Bordeaux - Sud-Ouest, France)*

## **Scheduling and Resource Management III**

Real-Time Scheduling Policy Selection from Queue and Machine States .381.....  
*Luis San'ana (Center for Mathematics, Computing and Cognition - Universidade Federal do ABC), Danilo Carastan-Santos (Univ. Grenoble Alpes, CNRS, Inria, LIG), Daniel Cordeiro (Univ. de São Paulo), and Raphael De Camargo (Center for Mathematics, Computing and Cognition - Universidade Federal do ABC)*

A Novel Stochastic Gradient Descent Algorithm Based on Grouping over Heterogeneous Cluster Systems for Distributed Deep Learning .391.....  
*Wenbin Jiang (Huazhong University of Science and Technology), Geyan Ye (Huazhong University of Science and Technology), Laurence T. Yang (Huazhong University of Science and Technology), Jian Zhu (Huazhong University of Science and Technology), Yang Ma (Huazhong University of Science and Technology), Xia Xie (Huazhong University of Science and Technology, ), and Hai Jin (Huazhong University of Science and Technology)*

Hybrid Resource Management for HPC and Data Intensive Workloads .399.....  
*Abel Souza (Umeå University), Mohamad Rezaei (KTH Royal Institute of Technology), Erwin Laure (KTH Royal Institute of Technology), and Johan Tordsson (Umeå University)*



## Architecture & Networking II

- Design and Characterization of Shared Address Space MPI Collectives on Modern Architectures .410.....  
*Jahanzeb Maqbool Hashmi (The Ohio State University), Sourav Chakraborty (The Ohio State University), Mohammadreza Bayatpour (The Ohio State University), Hari Subramoni (The Ohio State University), and Dhabaleswar K. Panda (The Ohio State University)*
- ESprint: QoS-Aware Management for Effective Computational Sprinting in Data Centers .420.....  
*Haoran Cai (Huazhong University of Science and Technology), Qiang Cao (Huazhong University of Science and Technology), Feng Sheng (Huazhong University of Science and Technology), Yang Yang (Huazhong University of Science and Technology), Changsheng Xie (Huazhong University of Science and Technology), and Liang Xiao (Huazhong University of Science and Technology)*
- Exhaustive Study of Hierarchical AllReduce Patterns for Large Messages Between GPUs .430.....  
*Yuichiro Ueno (Tokyo Institute of Technology) and Rio Yokota (Tokyo Institute of Technology)*

## Applications and Data Science

- Privacy-Preserving Record Linkage with Spark .440.....  
*Onno Valkering (University of Amsterdam) and Adam Belloum (University of Amsterdam)*
- Performance Evaluation of Big Data Processing Strategies for Neuroimaging .449.....  
*Valerie Hayot-Sasson (Concordia University), Shawn T Brown (Montreal Neurological Institute, McGill University, Montreal, Canada), and Tristan Glatard (Department of Computer Science and Software Engineering, Concordia University, Montreal, Canada)*
- Distributed Operator Placement for IoT Data Analytics Across Edge and Cloud Resources .459.....  
*Eduard Gibert Renart (Rutgers University), Alexandre Da Silva Veith (Inria, LIP, ENS Lyon, France), Daniel Balouek-Thomert (Rutgers University), Marcos Dias De Assunção (Inria, LIP, ENS Lyon, France), Laurent Lefèvre (Inria, LIP, ENS Lyon, France), and Manish Parashar (Rutgers University)*

## Edge Computing

- Adaptive Quality Optimization of Computer Vision Tasks in Resource-Constrained Devices using Edge Computing .469.....  
*Anas Toma (TU Dortmund University), Juri Wenner (TU Dortmund University), Jan Eric Lenssen (TU Dortmund University), and Jian-Jia Chen (TU Dortmund University)*
- Proximity-Aware Traffic Routing in Distributed Fog Computing Platforms .478.....  
*Ali J. Fahs (Univ Rennes, Inria, CNRS, IRISA) and Guillaume Pierre (Univ Rennes, Inria, CNRS, IRISA)*

On Cost-Driven Computation Offloading in the Edge: A New Model Approach .488.....  
*Mingzhe Du (Shenzhen institute of Advanced Technology), Yang Wang (Shenzhen institute of Advanced Technology), and Chengzhong Xu (University of Macau)*

Scalable Distributed DNN Training using TensorFlow and CUDA-Aware MPI: Characterization, Designs, and Performance Evaluation .498.....  
*Ammar Ahmad Awan (The Ohio State University), Jereon Bédorf (Minds.ai), Ching-Hsiang Chu (The Ohio State University), Hari Subramoni (The Ohio State University), and Dhabaleswar K. Panda (The Ohio State University)*

## HPML 2019: 2nd High Performance Machine Learning Workshop

Performance Optimization on Model Synchronization in Parallel Stochastic Gradient Descent Based SVM .508  
*Vibhatha Lakmal Abeykoon (Indiana University Bloomington), Geoffrey Charles Fox (Indiana University Bloomington), and Minje Kim (Indiana University Bloomington)*

Distributed MCMC Inference in Dirichlet Process Mixture Models Using Julia .518.....  
*Or Dinari (Ben Gurion University), Angel Yu (MIT), Oren Freifeld (Ben Gurion University), and John Fisher (MIT)*

TensorFlow on State-of-the-Art HPC Clusters: A Machine Learning use Case .526.....  
*Guillem Ramirez-Gargallo (Barcelona Supercomputing Center), Marta Garcia-Gasulla (Barcelona Supercomputing Center), and Filippo Mantovani (Barcelona Supercomputing Center)*

Theoretical Scalability Analysis of Distributed Deep Convolutional Neural Networks .534.....  
*Adrián Castelló (Universitat Politècnica de València), Manuel F. Dolz (Universitat Jaume I), Enrique S. Quintana-Ortí (Universitat Politècnica de València), and José Duato (Universitat Politècnica de València)*

An Evaluation of Transfer Learning for Classifying Sales Engagement Emails at Large Scale .542.....  
*Yong Liu (Outreach Corporation), Pavel Dmitriev (Outreach Corporation), Yifei Huang (Outreach Corporation), Andrew Brooks (Outreach Corporation), and Li Dong (Outreach Corporation)*

Volumetric Segmentation via Neural Networks Improves Neutron Crystallography Data Analysis .549.....  
*Brendan Sullivan (Neutron Scattering Division), Rick Archibald (Computer Science and Mathematics Division), Venu Vandavasi (Neutron Scattering Division), Patricia Langan (Neutron Scattering Division, Oak Ridge National Laboratory), Leighton Coates (Neutron Scattering Division, Oak Ridge National Laboratory), and Vickie Lynch (Neutron Scattering Division, Oak Ridge National Laboratory)*

## DBDM 2019: 4th IEEE/ACM International Workshop on Distributed Big Data Management

Effective and Efficient Big Data Management in Distributed Environments: Models, Issues, and Research Perspectives .556.....  
*Alfredo Cuzzocrea (University of Trieste)*

Data Driven Priority Scheduling on a Spark Streaming System .561.....	<i>Tobi Ajila (Carleton University) and Shikharesh Majumdar (Carleton University)</i>
Efficient Distributed Range Query Processing in Apache Spark .569.....	<i>Apostolos N. Papadopoulos (Aristotle University of Thessaloniki), Spyros Sioutas (University of Patras), Christos Zaroliagis (University of Patras), and Nikolaos Zacharatos (University of Patras)</i>
Adapting the Secretary Hiring Problem for Optimal Hot-Cold Tier Placement Under Top-K Workloads .576...	<i>Ben Blamey (Uppsala University), Fredrik Wrede (Uppsala University), Johan Karlsson (AstraZeneca), Andreas Hellander (Uppsala University), and Salman Toor (Uppsala University)</i>
Pattern Mining from big IoT Data with fog Computing: Models, Issues, and Research Perspectives .584.....	<i>Peter Braun (University of Manitoba), Alfredo Cuzzocrea (University of Trieste), Carson K. Leung (University of Manitoba), Adam G. M. Pazdor (University of Manitoba), Joglas Souza (University of Manitoba), and Syed K. Tanbeer (University of Manitoba)</i>

## **NEAC 2019: International Workshop on Network-Aware Big Data Computing**

Multi-objective Container Deployment on Heterogeneous Clusters .592.....	<i>Yang Hu (University of Amsterdam), Cees De Laat (University of Amsterdam), and Zhiming Zhao (University of Amsterdam)</i>
Deep Reinforcement Learning for IoT Network Dynamic Clustering in Edge Computing .600.....	<i>Qingzhi Liu (Eindhoven University of Technology), Long Cheng (University College Dublin), Tanir Ozcelebi (Eindhoven University of Technology), John Murphy (University College Dublin), and Johan Lukkien (Eindhoven University of Technology)</i>
Miracle: An Agile Colocation Platform for Enabling XaaS Cloud Architecture .604.....	<i>Mukhtiar Bano (Fatima Jinnah Women University Pakistan), Umar Ahmad Qureshi (Capital University of Science and Technology Pakistan), Rao Naveed Bin Rais (Ajman University United Arab Emirates), Mudassir Tufail (Citi Bank New Jersey USA), and Amir Qayyum (Capital University of Science and Technology Pakistan)</i>

## **CCGrid-Life 2019: Workshop on Clusters, Clouds and Grids for Life Sciences**

On Distributed Collaboration for Biomedical Analyses .611.....	<i>Fatima-Zahra Boujdad (IMT Atlantique, INRIA), Alban Gaignard (University of Nantes), Mario Südholt (IMT Atlantique, INRIA), Wilmer Garzón-Alfonso (Colombian School of Engineering), Luis Daniel Benavides Navarro (Colombian School of Engineering), and Richard Redon (University of Nantes)</i>
--	---

Reproducibility and Performance of Deep Learning Applications for Cancer Detection in Pathological Images .621.....	
	<i>Christoph Jansen (CBMI - HTW Berlin and Charité – Universitätsmedizin Berlin), Bruno Schilling (CBMI – HTW Berlin), Klaus Strohmenger (CBMI – HTW Berlin), Michael Witt (CBMI – HTW Berlin), Jonas Annuscheit (CBMI – HTW Berlin), and Dagmar Krefting (CBMI – HTW Berlin)</i>
Exploiting Stream Parallelism of MRI Reconstruction Using GrPPI over Multiple Back-Ends .631.....	
	<i>Javier Garcia-Blas (University Carlos III of Madrid), David del Rio Astorga (University Carlos III of Madrid), J. Daniel Garcia (University Carlos III of Madrid), and Jesus Carretero (University Carlos III of Madrid)</i>
Towards a Science Gateway for Bioinformatics: Experiences in the Brazilian System of High Performance Computing .638.....	
	<i>Kary Ocaña (National Laboratory of Scientific Computing), Marcelo Galheigo (National Laboratory of Scientific Computing), Carla Osthoff (National Laboratory of Scientific Computing), Luiz Gadelha (National Laboratory of Scientific Computing), Antônio Tadeu A. Gomes (National Laboratory of Scientific Computing), Daniel De Oliveira (Institute of Computing, Fluminense Federal University), Fabio Porto (National Laboratory of Scientific Computing), and Ana Tereza Vasconcelos (National Laboratory of Scientific Computing)</i>
Big Data Analytics Exploration of Green Space and Mental Health in Melbourne .648.....	
	<i>Ying Hu (University of Melbourne) and Richard O. Sinnott (University of Melbourne)</i>
Enabling Large Scale Data Production for OpenDose with GATE on the EGI Infrastructure .658.....	
	<i>Maxime Chauvin (Inserm, Universite Toulouse III Paul Sabatier), Gilles Mathieu (Inserm, DSI, Coordination de l'Informatique Scientifique), Sorina Camarasu-Pop (INSA-Lyon, Universite Lyon 1), Axel Bonnet (INSA-Lyon, Universite Lyon 1), Manuel Bardies (Inserm, Universite Toulouse III Paul Sabatier), and Isabelle Perseil (Inserm, DSI, Coordination de l'Informatique Scientifique)</i>

## **CrossCloud 2019: The 6th Workshop on CrossCloud Infrastructures & Platforms**

A Framework for SLO-driven Cloud Specification and Brokerage .666.....	
	<i>Abdessalam Elhabbash (Lancaster University, UK), Yehia Elkhatib (Lancaster University, UK), Gordon Blair (Lancaster University, UK), Yuhui Lin (University of St Andrews, UK), and Adam Barker (University of St Andrews, UK)</i>
Optimized Memory Management for a Java-Based Distributed In-memory System .668.....	
	<i>Stefan Nothaas (Heinrich-Heine-University Düsseldorf), Kevin Beineke (Heinrich-Heine-University Düsseldorf), and Michael Schoettner (Heinrich-Heine-University Düsseldorf)</i>
Extensible Declarative Management of Cloud Resources across Providers .678.....	
	<i>Oleksii Serhiienko (Zurich University of Applied Sciences), Panagiotis Gkikopoulos (Zurich University of Applied Sciences), and Josef Spillner (Zurich University of Applied Sciences)</i>

Towards Configurable Cloud Application Security .684.....  
*Kyriakos Kritikos (ICS-FORTH, Crete), Manos Papoutsakis (ICS-FORTH, Crete), Sotiris Ioannidis (ICS-FORTH, Crete), and Kostas Magoutis (ICS-FORTH, Crete)*

Same Same, but Different: A Descriptive Intra-IaaS Differentiation .690.....  
*Yehia Elkhatab (Lancaster University), Faiza Samreen (Lancaster University), and Gordon Blair (Lancaster University)*

A Performance Improvement Approach for Second-Order Optimization in Large Mini-batch Training .696.....  
*Hiroki Naganuma (Tokyo Institute of Technology) and Rio Yokota (Tokyo Institute of Technology)*

**Author Index 705.** .....