

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, Lancaster, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Friedemann Mattern

ETH Zurich, Zurich, Switzerland

John C. Mitchell

Stanford University, Stanford, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

C. Pandu Rangan

Indian Institute of Technology Madras, Chennai, India

Bernhard Steffen

TU Dortmund University, Dortmund, Germany

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Gerhard Weikum

Max Planck Institute for Informatics, Saarbrücken, Germany

More information about this series at <http://www.springer.com/series/7407>

Oswaldo Gervasi · Beniamino Murgante
Sanjay Misra · Elena Stankova
Carmelo M. Torre · Ana Maria A. C. Rocha
David Taniar · Bernady O. Apduhan
Eufemia Tarantino · Yeonseung Ryu (Eds.)

Computational Science and Its Applications – ICCSA 2018

18th International Conference
Melbourne, VIC, Australia, July 2–5, 2018
Proceedings, Part III

Preface

These multiple volumes (LNCS volumes 10960–10964) consist of the peer-reviewed papers presented at the 2018 International Conference on Computational Science and Its Applications (ICCSA 2018) held in Melbourne, Australia, during July 2–5, 2018.

ICCSA 2018 was a successful event in the International Conferences on Computational Science and Its Applications (ICCSA) conference series, previously held in Trieste, Italy (2017), Beijing, China (2016), Banff, Canada (2015), Guimaraes, Portugal (2014), Ho Chi Minh City, Vietnam (2013), Salvador, Brazil (2012), Santander, Spain (2011), Fukuoka, Japan (2010), Suwon, South Korea (2009), Perugia, Italy (2008), Kuala Lumpur, Malaysia (2007), Glasgow, UK (2006), Singapore (2005), Assisi, Italy (2004), Montreal, Canada (2003), and (as ICCS) Amsterdam, The Netherlands (2002) and San Francisco, USA (2001).

Computational science is a main pillar of most current research and industrial and commercial activities and it plays a unique role in exploiting ICT innovative technologies. The ICCSA conference series has been providing a venue to researchers and industry practitioners to discuss new ideas, to share complex problems and their solutions, and to shape new trends in computational science.

Apart from the general tracks, ICCSA 2018 also included 33 international workshops, in various areas of computational sciences, ranging from computational science technologies, to specific areas of computational sciences, such as computer graphics and virtual reality. The program also featured three keynote speeches.

The success of the ICCSA conference series, in general, and ICCSA 2018, in particular, is due to the support of many people: authors, presenters, participants, keynote speakers, session chairs, Organizing Committee members, student volunteers, Program Committee members, International Advisory Committee members, International Liaison chairs, and people in other various roles. We would like to thank them all.

We would also like to thank Springer for their continuous support in publishing the ICCSA conference proceedings and for sponsoring some of the paper awards.

July 2018

David Taniar
Bernady O. Apduhan
Osvaldo Gervasi
Beniamino Murgante
Ana Maria A. C. Rocha

Welcome to Melbourne

Welcome to “The Most Liveable City”¹, Melbourne, Australia. ICCSA 2018 was held at Monash University, Caulfield Campus, during July 2–5, 2018.

Melbourne is the state capital of Victoria, and is currently the second most populous city in Australia, behind Sydney. There are lots of things to do and experience while in Melbourne. Here is an incomplete list:

- Visit and experience Melbourne’s best coffee shops
- Discover Melbourne’s hidden laneways and rooftops
- Walk along the Yarra River
- Eat your favourite food (Chinese, Vietnamese, Malaysian, Italian, Greek, anything, ... you name it)
- Buy souvenirs at the Queen Victoria Market
- Go up to the Eureka, the tallest building in Melbourne
- Visit Melbourne’s museums
- Walk and enjoy Melbourne’s gardens and parks
- Visit the heart-shape lake, Albert Park Lake, the home of the F1 Grand Prix
- Simply walk in the city to enjoy Melbourne experience
- Try Melbourne’s gelato ice cream

Basically, it is easy to live in and to explore Melbourne, and I do hope that you will have time to explore the city of Melbourne.

The venue of ICCSA 2018 was in Monash University. Monash University is a member of Go8, which is considered the top eight universities in Australia. Monash University has a number of campuses and centers. The two main campuses in Melbourne are Clayton and Caulfield. ICCSA 2018 was held on Caulfield Campus, which is only 12 minutes away from Melbourne CBD by train.

The Faculty of Information Technology is one of the ten faculties at Monash University. The faculty has more than 100 full-time academic staff (equivalent to the rank of Assistant Professor, Associate Professor, and Professor).

I do hope that you will enjoy not only the conference, but also Melbourne.

David Taniar

¹ The Global Liveability Report 2017, <https://www.cnbc.com/2017/08/17/the-worlds-top-10-most-liveable-cities.html>

Organization

ICCSA 2018 was organized by Monash University (Australia), University of Perugia (Italy), Kyushu Sangyo University (Japan), University of Basilicata (Italy), and University of Minho, (Portugal).

Honorary General Chairs

Antonio Laganà	University of Perugia, Italy
Norio Shiratori	Tohoku University, Japan
Kenneth C. J. Tan	Sardina Systems, Estonia

General Chairs

David Taniar	Monash University, Australia
Bernady O. Apduhan	Kyushu Sangyo University, Japan

Program Committee Chairs

Osvaldo Gervasi	University of Perugia, Italy
Beniamino Murgante	University of Basilicata, Italy
Ana Maria A. C. Rocha	University of Minho, Portugal

International Advisory Committee

Jemal Abawajy	Deakin University, Australia
Dharma P. Agrawal	University of Cincinnati, USA
Marina L. Gavrilova	University of Calgary, Canada
Claudia Bauzer Medeiros	University of Campinas, Brazil
Manfred M. Fisher	Vienna University of Economics and Business, Austria
Yee Leung	Chinese University of Hong Kong, SAR China

International Liaison Chairs

Ana Carla P. Bitencourt	Universidade Federal do Reconcavo da Bahia, Brazil
Giuseppe Borruso	University of Trieste, Italy
Alfredo Cuzzocrea	University of Trieste, Italy
Maria Irene Falcão	University of Minho, Portugal
Robert C. H. Hsu	Chung Hua University, Taiwan
Tai-Hoon Kim	Hannam University, South Korea
Sanjay Misra	Covenant University, Nigeria
Takashi Naka	Kyushu Sangyo University, Japan

Rafael D. C. Santos National Institute for Space Research, Brazil
Maribel Yasmina Santos University of Minho, Portugal

Workshop and Session Organizing Chairs

Beniamino Murgante University of Basilicata, Italy
Sanjay Misra Covenant University, Nigeria
Jorge Gustavo Rocha University of Minho, Portugal

Award Chair

Wenny Rahayu La Trobe University, Australia

Web Chair

A. S. M. Kayes La Trobe University, Australia

Publicity Committee Chairs

Elmer Dadios De La Salle University, Philippines
Hong Quang Nguyen International University (VNU-HCM), Vietnam
Daisuke Takahashi Tsukuba University, Japan
Shangwang Wang Beijing University of Posts and Telecommunications,
China

Workshop Organizers

Advanced Methods in Fractals and Data Mining for Applications (AMFDMA 2018)

Yeliz Karaca IEEE
Carlo Cattani Tuscia University, Italy
Majaz Moonis University of Massachusettes Medical School, USA

Advances in Information Systems and Technologies for Emergency Management, Risk Assessment and Mitigation Based on Resilience Concepts (ASTER 2018)

Maurizio Pollino ENEA, Italy
Marco Vona University of Basilicata, Italy
Beniamino Murgante University of Basilicata, Italy
Grazia Fattoruso ENEA, Italy

Advances in Web-Based Learning (AWBL 2018)

Mustafa Murat Inceoglu Ege University, Turkey
Birol Ciloglugil Ege University, Turkey

Bio- and Neuro-inspired Computing and Applications (BIONCA 2018)

Nadia Nedjah State University of Rio de Janeiro, Brazil

Luiza de Macedo Mourell State University of Rio de Janeiro, Brazil

Computer-Aided Modeling, Simulation, and Analysis (CAMSA 2018)

Jie Shen University of Michigan, USA

Hao Chen Shanghai University of Engineering Science, China

Youguo He Jiangsu University, China

Computational and Applied Statistics (CAS 2018)

Ana Cristina Braga University of Minho, Portugal

Computational Geometry and Security Applications (CGSA 2018)

Marina L. Gavrilova University of Calgary, Canada

Computational Movement Analysis (CMA 2018)

Farid Karimipour University of Tehran, Iran

Computational Mathematics, Statistics and Information Management (CMSIM 2018)

M. Filomena Teodoro Lisbon University and Portuguese Naval Academy,
Portugal

Computational Optimization and Applications (COA 2018)

Ana Maria Rocha University of Minho, Portugal

Humberto Rocha University of Coimbra, Portugal

Computational Astrochemistry (CompAstro 2018)

Marzio Rosi University of Perugia, Italy

Dimitrios Skouteris Scuola Normale Superiore di Pisa, Italy

Albert Rimola Universitat Autònoma de Barcelona, Spain

Cities, Technologies, and Planning (CTP 2018)

Giuseppe Borruso University of Trieste, Italy

Beniamino Murgante University of Basilicata, Italy

Defense Technology and Security (DTS 2018)

Yeonseung Ryu Myongji University, South Korea

Econometrics and Multidimensional Evaluation in the Urban Environment (EMEUE 2018)

Carmelo M. Torre	Polytechnic of Bari, Italy
Maria Cerreta	University of Naples Federico II, Italy
Pierluigi Morano	Polytechnic of Bari, Italy
Paola Perchinunno	University of Bari, Italy

Future Computing Systems, Technologies, and Applications (FISTA 2018)

Bernady O. Apduhan	Kyushu Sangyo University, Japan
Rafael Santos	National Institute for Space Research, Brazil
Shangguang Wang	Beijing University of Posts and Telecommunications, China
Kazuaki Tanaka	Kyushu Institute of Technology, Japan

Geographical Analysis, Urban Modeling, Spatial Statistics (GEO-AND-MOD 2018)

Giuseppe Borruso	University of Trieste, Italy
Beniamino Murgante	University of Basilicata, Italy
Hartmut Asche	University of Potsdam, Germany

Geomatics for Resource Monitoring and Control (GRMC 2018)

Eufemia Tarantino	Polytechnic of Bari, Italy
Umberto Fratino	Polytechnic of Bari, Italy
Benedetto Figorito	ARPA Puglia, Italy
Antonio Novelli	Polytechnic of Bari, Italy
Rosa Lasaponara	Italian Research Council, IMAA-CNR, Italy

International Symposium on Software Quality (ISSQ 2018)

Sanjay Misra	Covenant University, Nigeria
--------------	------------------------------

Web-Based Collective Evolutionary Systems: Models, Measures, Applications (IWCES 2018)

Alfredo Milani	University of Perugia, Italy
Clement Leung	United International College, Zhouhai, China
Valentina Franzoni	University of Rome La Sapienza, Italy
Valentina Poggioni	University of Perugia, Italy

Large-Scale Computational Physics (LSCP 2018)

Elise de Doncker	Western Michigan University, USA
Fukuko Yuasa	High Energy Accelerator Research Organization, KEK, Japan
Hideo Matsufuru	High Energy Accelerator Research Organization, KEK, Japan

Land Use Monitoring for Soil Consumption Reduction (LUMS 2018)

Carmelo M. Torre	Polytechnic of Bari, Italy
Alessandro Bonifazi	Polytechnic of Bari, Italy
Pasquale Balena	Polytechnic of Bari, Italy
Beniamino Murgante	University of Basilicata, Italy
Eufemia Tarantino	Polytechnic of Bari, Italy

Mobile Communications (MC 2018)

Hyunseung Choo	Sungkyunkwan University, South Korea
----------------	--------------------------------------

Scientific Computing Infrastructure (SCI 2018)

Elena Stankova	Saint-Petersburg State University, Russia
Vladimir Korkhov	Saint-Petersburg State University, Russia

International Symposium on Software Engineering Processes and Applications (SEPA 2018)

Sanjay Misra	Covenant University, Nigeria
--------------	------------------------------

Smart Factory Convergence (SFC 2018)

Jongpil Jeong	Sungkyunkwan University, South Korea
---------------	--------------------------------------

Is a Smart City Really Smart? Models, Solutions, Proposals for an Effective Urban and Social Development (Smart_Cities 2018)

Giuseppe Borruso	University of Trieste, Italy
Chiara Garau	University of Cagliari, Italy
Ginevra Balletto	University of Cagliari, Italy
Beniamino Murgante	University of Basilicata, Italy
Paola Zamberlin	University of Florence, Italy

Sustainability Performance Assessment: Models, Approaches and Applications Toward Interdisciplinary and Integrated Solutions (SPA 2018)

Francesco Scorza	University of Basilicata, Italy
Valentin Grecu	Lucia Blaga University on Sibiu, Romania
Jolanta Dvarioniene	Kaunas University, Lithuania
Sabrina Lai	Cagliari University, Italy

Advances in Spatio-Temporal Analytics (ST-Analytics 2018)

Rafael Santos	Brazilian Space Research Agency, Brazil
Karine Reis Ferreira	Brazilian Space Research Agency, Brazil
Joao Moura Pires	New University of Lisbon, Portugal
Maribel Yasmina Santos	University of Minho, Portugal

Theoretical and Computational Chemistry and Its Applications (TCCA 2018)

M. Noelia Faginas Lago University of Perugia, Italy
Andrea Lombardi University of Perugia, Italy

Tools and Techniques in Software Development Processes (TTSDP 2018)

Sanjay Misra Covenant University, Nigeria

Challenges, Trends and Innovations in VGI (VGI 2018)

Beniamino Murgante University of Basilicata, Italy
Rodrigo Tapia-McClung Centro de Investigación en Geografía y Geomática Ing
Jorge L. Tamay, Mexico
Claudia Ceppi Polytechnic of Bari, Italy
Jorge Gustavo Rocha University of Minho, Portugal

Virtual Reality and Applications (VRA 2018)

Oswaldo Gervasi University of Perugia, Italy
Sergio Tasso University of Perugia, Italy

International Workshop on Parallel and Distributed Data Mining (WPDM 2018)

Massimo Cafaro University of Salento, Italy
Italo Epicoco University of Salento, Italy
Marco Pulimeno University of Salento, Italy
Giovanni Aloisio University of Salento, Italy

Program Committee

Kenny Adamson University of Ulster, UK
Vera Afreixo University of Aveiro, Portugal
Filipe Alvelos University of Minho, Portugal
Hartmut Asche University of Potsdam, Germany
Michela Bertolotto University College Dublin, Ireland
Sandro Bimonte CEMAGREF, TSCF, France
Rod Blais University of Calgary, Canada
Ivan Blečić University of Sassari, Italy
Giuseppe Borruso University of Trieste, Italy
Ana Cristina Braga University of Minho, Portugal
Yves Caniou Lyon University, France
José A. Cardoso e Cunha Universidade Nova de Lisboa, Portugal
Rui Cardoso University of Beira Interior, Portugal
Leocadio G. Casado University of Almeria, Spain
Carlo Cattani University of Salerno, Italy
Metek Celik Erciyes University, Turkey
Alexander Chemeris National Technical University of Ukraine KPI, Ukraine
Min Young Chung Sungkyunkwan University, South Korea

Florbela Maria da Cruz Domingues Correia	Polytechnic Institute of Viana do Castelo, Portugal
Gilberto Corso Pereira	Federal University of Bahia, Brazil
Carla Dal Sasso Freitas	Universidade Federal do Rio Grande do Sul, Brazil
Pradesh Debba	The Council for Scientific and Industrial Research (CSIR), South Africa
Hendrik Decker	Instituto Tecnológico de Informática, Spain
Frank Devai	London South Bank University, UK
Rodolphe Devillers	Memorial University of Newfoundland, Canada
Joana Matos Dias	University of Coimbra, Portugal
Paolino Di Felice	University of L'Aquila, Italy
Prabu Dorairaj	NetApp, India/USA
M. Irene Falcao	University of Minho, Portugal
Cherry Liu Fang	U.S. DOE Ames Laboratory, USA
Florbela P. Fernandes	Polytechnic Institute of Bragança, Portugal
Jose-Jesus Fernandez	National Centre for Biotechnology, CSIS, Spain
Paula Odete Fernandes	Polytechnic Institute of Bragança, Portugal
Adelaide de Fátima Baptista Valente Freitas	University of Aveiro, Portugal
Manuel Carlos Figueiredo	University of Minho, Portugal
Maria Antonia Forjaz	University of Minho, Portugal
Maria Celia Furtado Rocha	PRODEB-PósCultura/UFBA, Brazil
Paulino Jose Garcia Nieto	University of Oviedo, Spain
Jerome Gensel	LSR-IMAG, France
Maria Giaoutzi	National Technical University, Athens, Greece
Armanda Manuela Andrade Pereira Gonçalves	University of Minho, Portugal
Andrzej M. Goscinski	Deakin University, Australia
Sevin Gmıgmı	Izmir University of Economics, Turkey
Alex Hagen-Zanker	University of Cambridge, UK
Malgorzata Hanzl	Technical University of Lodz, Poland
Shanmugasundaram Hariharan	B.S. Abdur Rahman University, India
Eligius M. T. Hendrix	University of Malaga/Wageningen University, Spain/The Netherlands
Tutut Herawan	Universitas Teknologi Yogyakarta, Indonesia
Hisamoto Hiyoshi	Gunma University, Japan
Fermin Huarte	University of Barcelona, Spain
Mustafa Inceoglu	EGE University, Turkey
Peter Jimack	University of Leeds, UK
Qun Jin	Waseda University, Japan
A. S. M. Kayes	La Trobe University, Australia
Farid Karimipour	Vienna University of Technology, Austria
Baris Kazar	Oracle Corp., USA
Maulana Adhinugraha Kiki	Telkom University, Indonesia
DongSeong Kim	University of Canterbury, New Zealand

Taihoon Kim	Hannam University, South Korea
Ivana Kolingerova	University of West Bohemia, Czech Republic
Rosa Lasaponara	National Research Council, Italy
Maurizio Lazzari	National Research Council, Italy
Cheng Siong Lee	Monash University, Australia
Sangyoun Lee	Yonsei University, South Korea
Jongchan Lee	Kunsan National University, South Korea
Clement Leung	Hong Kong Baptist University, Hong Kong, SAR China
Chendong Li	University of Connecticut, USA
Gang Li	Deakin University, Australia
Ming Li	East China Normal University, China
Fang Liu	AMES Laboratories, USA
Xin Liu	University of Calgary, Canada
Savino Longo	University of Bari, Italy
Tinghuai Ma	NanJing University of Information Science and Technology, China
Luca Mancinelli	Trinity College Dublin, Ireland
Ernesto Marcheggiani	Katholieke Universiteit Leuven, Belgium
Antonino Marvuglia	Research Centre Henri Tudor, Luxembourg
Nicola Masini	National Research Council, Italy
Eric Medvet	University of Trieste, Italy
Nirvana Meratnia	University of Twente, The Netherlands
Alfredo Milani	University of Perugia, Italy
Giuseppe Modica	University of Reggio Calabria, Italy
José Luis Montaña	University of Cantabria, Spain
Maria Filipa Mourão	IP from Viana do Castelo, Portugal
Laszlo Neumann	University of Girona, Spain
Kok-Leong Ong	Deakin University, Australia
Belen Palop	Universidad de Valladolid, Spain
Marcin Paprzycki	Polish Academy of Sciences, Poland
Eric Pardede	La Trobe University, Australia
Kwangjin Park	Wonkwang University, South Korea
Ana Isabel Pereira	Polytechnic Institute of Bragança, Portugal
Maurizio Pollino	Italian National Agency for New Technologies, Energy and Sustainable Economic Development, Italy
Alenka Poplin	University of Hamburg, Germany
Vidyasagar Potdar	Curtin University of Technology, Australia
David C. Proserpi	Florida Atlantic University, USA
Wenny Rahayu	La Trobe University, Australia
Jerzy Respondek	Silesian University of Technology, Poland
Humberto Rocha	INESC-Coimbra, Portugal
Alexey Rodionov	Institute of Computational Mathematics and Mathematical Geophysics, Russia

Jon Rokne	University of Calgary, Canada
Octavio Roncero	CSIC, Spain
Maytham Safar	Kuwait University, Kuwait
Chiara Saracino	A.O. Ospedale Niguarda Ca' Granda - Milano, Italy
Haiduke Sarafian	The Pennsylvania State University, USA
Marco Paulo Seabra dos Reis	University of Coimbra, Portugal
Jie Shen	University of Michigan, USA
Qi Shi	Liverpool John Moores University, UK
Dale Shires	U.S. Army Research Laboratory, USA
Inês Soares	University of Coimbra, Portugal
Takuo Suganuma	Tohoku University, Japan
Sergio Tasso	University of Perugia, Italy
Ana Paula Teixeira	University of Trás-os-Montes and Alto Douro, Portugal
Senhorinha Teixeira	University of Minho, Portugal
Parimala Thulasiraman	University of Manitoba, Canada
Carmelo Torre	Polytechnic of Bari, Italy
Javier Martinez Torres	Centro Universitario de la Defensa Zaragoza, Spain
Giuseppe A. Trunfio	University of Sassari, Italy
Toshihiro Uchibayashi	Kyushu Sangyo University, Japan
Pablo Vanegas	University of Cuenca, Ecuador
Marco Vizzari	University of Perugia, Italy
Varun Vohra	Merck Inc., USA
Koichi Wada	University of Tsukuba, Japan
Krzysztof Walkowiak	Wroclaw University of Technology, Poland
Zequn Wang	Intelligent Automation Inc., USA
Robert Weibel	University of Zurich, Switzerland
Frank Westad	Norwegian University of Science and Technology, Norway
Roland Wismüller	Universität Siegen, Germany
Mudasser Wyne	SOET National University, USA
Chung-Huang Yang	National Kaohsiung Normal University, Taiwan
Xin-She Yang	National Physical Laboratory, UK
Salim Zabir	France Telecom Japan Co., Japan
Haifeng Zhao	University of California, Davis, USA
Kewen Zhao	University of Qiongzhou, China
Fabiana Zollo	University of Venice Cà Foscari, Italy
Albert Y. Zomaya	University of Sydney, Australia

Reviewers

Afreixo Vera	University of Aveiro, Portugal
Ahmad Rashid	Microwave and Antenna Lab, School of Engineering, Korea
Aguilar José Alfonso	Universidad Autónoma de Sinaloa, Mexico
Albanese Valentina	Università di Bologna, Italy
Alvelos Filipe	University of Minho, Portugal
Amato Federico	University of Basilicata, Italy
Andrianov Serge	Institute for Informatics of Tatarstan Academy of Sciences, Russia
Antunes Marília	University Nova de Lisboa, Portugal
Apduhan Bernady	Kyushu Sangyo University, Japan
Aquilanti Vincenzo	University of Perugia, Italy
Asche Hartmut	Potsdam University, Germany
Aslan Zafer	Istanbul Aydin University, Turkey
Aytaç Vecdi	Ege University, Turkey
Azevedo Ana	Instituto Superior de Engenharia do Porto, Portugal
Azzari Margherita	Università degli Studi di Firenze, Italy
Bae Ihn-Han	Catholic University of Daegu, South Korea
Balci Birim	Celal Bayar Üniversitesi, Turkey
Balena Pasquale	Politecnico di Bari, Italy
Balucani Nadia	University of Perugia, Italy
Barroca Filho Itamir	Instituto Metr�pole Digital da UFRN (IMD-UFRN), Brazil
Bayrak Şeng�l	Haliç University, Turkey
Behera Ranjan Kumar	Indian Institute of Technology Patna, India
Bimonte Sandro	IRSTEA, France
Bogdanov Alexander	Saint-Petersburg State University, Russia
Bonifazi Alessandro	Polytechnic of Bari, Italy
Borruso Giuseppe	University of Trieste, Italy
Braga Ana Cristina	University of Minho, Portugal
Cafaro Massimo	University of Salento, Italy
Canora Filomena	University of Basilicata, Italy
Cao Yuanlong	University of Saskatchewan, Canada
Caradonna Grazia	Polytechnic of Bari, Italy
Cardoso Rui	Institute of Telecommunications, Portugal
Carolina Tripp Barba	Universidad Aut�noma de Sinaloa, Mexico
Caroti Gabriella	University of Pisa, Italy
Ceccarello Matteo	University of Padova, Italy
Cefalo Raffaella	University of Trieste, Italy
Cerreta Maria	University Federico II of Naples, Italy
Challa Rajesh	Sungkyunkwan University, Korea
Chamundeswari Arumugam	SSN College of Engineering, India
Chaturvedi Krishna Kumar	Patil Group of Industries, India
Cho Chulhee	Seoul Guarantee Insurance Company Ltd., Korea

Choi Jae-Young	Sungkyunkwan University, Korea
Choi Kwangnam	Korea Institute of Science and Technology Information, Korea
Choi Seonho	Seoul National University, Korea
Chung Min Young	Sungkyunkwan University, Korea
Ciloglugil Birol	Ege University, Turkey
Coletti Cecilia	University of Chieti, Italy
Congiu Tanja	Università degli Studi di Sassari, Italy
Correia Anacleto	Base Naval de Lisboa, Portugal
Correia Elisete	University of Trás-Os-Montes e Alto Douro, Portugal
Correia Florbela Maria da Cruz Domingues	Instituto Politécnico de Viana do Castelo, Portugal
Costa e Silva Eliana	Polytechnic of Porto, Portugal
Cugurullo Federico	Trinity College Dublin, Ireland
Damas Bruno	LARSyS, Instituto Superior Técnico, Univ. Lisboa, Portugal
Dang Thien Binh	Sungkyunkwan University, Korea
Daniele Bartoli	University of Perugia, Italy
de Doncker Elise	Western Michigan University, USA
Degtyarev Alexander	Saint-Petersburg State University, Russia
Demyanov Vasily	Heriot-Watt University, UK
Devai Frank	London South Bank University, UK
Di Fatta Giuseppe	University of Reading, UK
Dias Joana	University of Coimbra, Portugal
Dilo Arta	University of Twente, The Netherlands
El-Zawawy Mohamed A.	Cairo University, Egypt
Epicoco Italo	Università del Salento, Italy
Escalona Maria-Jose	University of Seville, Spain
Falcinelli Stefano	University of Perugia, Italy
Faginas-Lago M. Noelia	University of Perugia, Italy
Falcão M. Irene	University of Minho, Portugal
Famiano Michael	Western Michigan University, USA
Fattoruso Grazia	ENEA, Italy
Fernandes Florbela	Escola Superior de Tecnologia e Gestão de Braganca, Portugal
Fernandes Paula	Escola Superior de Tecnologia e Gestão, Portugal
Ferraro Petrillo Umberto	University of Rome “La Sapienza”, Italy
Ferreira Fernanda	Escola Superior de Estudos Industriais e de Gestão, Portugal
Ferrão Maria	Universidade da Beira Interior, Portugal
Figueiredo Manuel Carlos	Universidade do Minho, Portugal
Fiorini Lorena	Università degli Studi dell’Aquila, Italy
Florez Hector	Universidad Distrital Francisco Jose de Caldas, Colombia
Franzoni Valentina	University of Perugia, Italy

Freitau Adelaide de Fátima Baptista Valente	University of Aveiro, Portugal
Gabrani Goldie	Bml Munjal University, India
Garau Chiara	University of Cagliari, Italy
Garcia Ernesto	University of the Basque Country, Spain
Gavrilova Marina	University of Calgary, Canada
Gervasi Osvaldo	University of Perugia, Italy
Gioia Andrea	University of Bari, Italy
Giorgi Giacomo	University of Perugia, Italy
Giuliani Felice	Università degli Studi di Parma, Italy
Goel Rajat	University of Southern California, USA
Gonçalves Arminda Manuela	University of Minho, Portugal
Gorbachev Yuriy	Geolink Technologies, Russia
Gordon-Ross Ann	University of Florida, USA
Goyal Rinkaj	Guru Gobind Singh Indraprastha University, India
Grilli Luca	University of Perugia, Italy
Goyal Rinkaj	GGs Indraprastha University, India
Guerra Eduardo	National Institute for Space Research, Brazil
Gumgum Sevin	İzmir Ekonomi Üniversitesi, Turkey
Gülen Kemal Güven	Istanbul Ticaret University, Turkey
Hacızade Ulviye	Haliç Üniversitesi Uluslararası, Turkey
Han Longzhe	Nanchang Institute of Technology, Korea
Hanzl Malgorzata	University of Lodz, Poland
Hayashi Masaki	University of Calgary, Canada
He Youguo	Jiangsu University, China
Hegedus Peter	University of Szeged, Hungary
Herawan Tutut	Universiti Malaysia Pahang, Malaysia
Ignaccolo Matteo	University of Catania, Italy
Imakura Akira	University of Tsukuba, Japan
Inceoglu Mustafa	Ege University, Turkey
Jagwani Priti	Indian Institute of Technology Delhi, India
Jang Jeongsook	Brown University, Korea
Jeong Jongpil	Sungkyunkwan University, Korea
Jin Hyunwook	Konkuk University, Korea
Jorge Ana Maria, Kapenga John	Western Michigan University, USA
Kawana Kojiro	University of Tokio, Japan
Kayes Abu S. M.	La Trobe University, Australia
Kim JeongAh	George Fox University, USA
Korkhov Vladimir	St. Petersburg State University, Russia
Kulabukhova Nataliia	Saint-Peterburg State University, Russia
Kumar Pawan	Expert Software Consultants Ltd., India
Laccetti Giuliano	Università degli Studi di Napoli, Italy
Laganà Antonio	Master-up srl, Italy
Lai Sabrina	University of Cagliari, Italy

Laricchiuta Annarita	CNR-IMIP, Italy
Lazzari Maurizio	CNR IBAM, Italy
Lee Soojin	Cyber Security Lab, Korea
Leon Marcelo	Universidad Estatal Península de Santa Elena – UPSE, Ecuador
Lim Ilkyun	Sungkyunkwan University, Korea
Lourenço Vanda Marisa	University Nova de Lisboa, Portugal
Mancinelli Luca	University of Dublin, Ireland
Mangiameli Michele	University of Catania, Italy
Markov Krassimiri	Institute for Information Theories and Applications, Bulgaria
Marques Jorge	Universidade de Coimbra, Portugal
Marvuglia Antonino	Public Research Centre Henri Tudor, Luxembourg
Mateos Cristian	Universidad Nacional del Centro, Argentina
Matsufuru Hideo	High Energy Accelerator Research, Japan
Maurizio Crispini	Politecnico di Milano, Italy
Medvet Eric	University of Trieste, Italy
Mengoni Paolo	Università degli Studi di Firenze, Italy
Mesiti Marco	Università degli studi di Milano, Italy
Millham Richard	Durban University of Technology, South Africa
Misra Sanjay	Covenant University, Nigeria
Mishra Anurag	Helmholtz Zentrum München, Germany
Mishra Biswajeeban	University of Szeged, Hungary
Moscato Pablo	University of Newcastle, Australia
Moura Pires Joao	Universidade Nova de Lisboa, Portugal
Moura Ricardo	Universidade Nova de Lisboa, Portugal
Mourao Maria	Universidade do Minho, Portugal
Mukhopadhyay Asish	University of Windsor, Canada
Murgante Beniamino	University of Basilicata, Italy
Nakasato Naohito	University of Aizu, Japan
Nguyen Tien Dzung	Sungkyunkwan University, South Korea
Nicolosi Vittorio	University of Rome Tor Vergata, Italy
Ogihara Mitsunori	University of Miami, USA
Oh Sangyoon	Ajou University, Korea
Oliveira Irene	University of Trás-Os-Montes e Alto Douro, Portugal
Oluranti Jonathan	Covenant University, Nigeria
Ozturk Savas	The Scientific and Technological Research Council of Turkey, Turkey
P. Costa M. Fernanda	University of Minho, Portugal
Paek Yunheung	Seoul National University, Korea
Pancham Jay	Durban University of Technology, South Africa
Pantazis Dimos	Technological Educational Institute of Athens, Greek
Paolucci Michela	Università degli Studi di Firenze, Italy
Pardede Eric	La Trobe University, Australia
Park Hyun Kyoo	Petabi Corp, Korea
Passaro Tommaso	University of Bari, Italy

Pereira Ana	Instituto Politécnico de Bragança, Portugal
Peschechera Giuseppe	University of Bari, Italy
Petri Massimiliano	Università di Pisa, Italy
Pham Quoc Trung	Ho Chi Minh City University of Technology, Vietnam
Piemonte Andrea	Università di Pisa, Italy
Pinna Francesco	Università degli Studi di Cagliari, Italy
Pinto Telmo	University of Minho, Portugal
Pollino Maurizio	ENEA, Italy
Pulimeno Marco	University of Salento, Italy
Rahayu Wenny	La Trobe University, Australia
Rao S. V.	Duke Clinical Research, USA
Raza Syed Muhammad	Sungkyunkwan University, South Korea
Reis Ferreira Gomes Karine	National Institute for Space Research, Brazil
Reis Marco	Universidade de Coimbra, Portugal
Rimola Albert	Autonomous University of Barcelona, Spain
Rocha Ana Maria	University of Minho, Portugal
Rocha Humberto	University of Coimbra, Portugal
Rodriguez Daniel	The University of Queensland, Australia
Ryu Yeonseung	Myongji University, South Korea
Sahni Himantikka	CRISIL Global Research and Analytics, India
Sahoo Kshira Sagar	C. V. Raman College of Engineering, India
Santos Maribel Yasmina	University of Minho, Portugal
Santos Rafael	KU Leuven, Belgium
Saponaro Mirko	Politecnico di Bari, Italy
Scorza Francesco	Università della Basilicata, Italy
Sdao Francesco	Università della Basilicata, Italy
Shen Jie	University of Southampton, UK
Shintani Takahiko	University of Electro-Communications, Japan
Shoalb Muhammad	Sungkyunkwan University, South Korea
Silva-Fortes Carina	ESTeSL-IPL, Portugal
Singh V. B.	University of Delhi, India
Skouteris Dimitrios	SNS, Italy
Soares Inês	INESCC and IPATIMUP, Portugal
Sosnin Petr	Ulyanovsk State Technical University, Russia
Souza Erica	Universidade Nova de Lisboa, Portugal
Stankova Elena	Saint-Petersburg State University, Russia
Sumida Yasuaki	Kyushu Sangyo University, Japan
Tanaka Kazuaki	Kyushu Institute of Technology, Japan
Tapia-McClung Rodrigo	CentroGeo, Mexico
Tarantino Eufemia	Politecnico di Bari, Italy
Tasso Sergio	University of Perugia, Italy
Teixeira Ana Paula	Universidade Católica Portuguesa, Portugal
Tengku Adil	La Trobe University, Australia
Teodoro M. Filomena	Lisbon University, Portugal
Tiwari Sunita	King George's Medical University, India
Torre Carmelo Maria	Polytechnic of Bari, Italy

Torrise Vincenza	University of Catania, Italy
Totaro Vincenzo	Politecnico di Bari, Italy
Tran Manh Hung	Institute for Research and Executive Education, Vietnam
Tripathi Aprna	GLA University, India
Trunfio Giuseppe A.	University of Sassari, Italy
Tóth Zoltán	Hungarian Academy of Sciences, Hungary
Uchibayashi Toshihiro	Kyushu Sangyo University, Japan
Ugliengo Piero	University of Torino, Italy
Ullman Holly	University of Delaware, USA
Vallverdu Jordi	Autonomous University of Barcelona, Spain
Valuev Ilya	Russian Academy of Sciences, Russia
Vasyunin Dmitry	University of Amsterdam, The Netherlands
Vohra Varun	University of Electro-Communications, Japan
Voit Nikolay	Ulyanovsk State Technical University, Russia
Wale Azeez Nurayhn	University of Lagos, Nigeria
Walkowiak Krzysztof	Wroclaw University of Technology, Poland
Wallace Richard J.	Univeristy of Texas, USA
Waluyo Agustinus Borgy	Monash University, Australia
Westad Frank	CAMO Software AS, USA
Wole Adewumi	Covenant University, Nigeria
Xie Y. H.	Bell Laboratories, USA
Yamauchi Toshihiro	Okayama University, Japan
Yamazaki Takeshi	University of Tokyo, Japan
Yao Fenghui	Tennessee State University, USA
Yoki Karl	Catholic University of Daegu, South Korea
Yoshiura Noriaki	Saitama University, Japan
Yuasa Fukuko	High Energy Accelerator Research Organization, Korea
Zamperlin Paola	University of Florence, Italy
Zollo Fabiana	University of Venice "Cà Foscari", Italy
Zullo Francesco	University of L'Aquila, Italy
Zivkovic Ljiljana	Republic Agency for Spatial Planning, Belgrade

Sponsoring Organizations

ICCSA 2018 would not have been possible without the tremendous support of many organizations and institutions, for which all organizers and participants of ICCSA 2018 express their sincere gratitude:



Springer International Publishing AG, Germany
(<http://www.springer.com>)



Monash University, Australia
(<http://monash.edu>)



University of Perugia, Italy
(<http://www.unipg.it>)



University of Basilicata, Italy
(<http://www.unibas.it>)



Kyushu Sangyo University, Japan
(www.kyusan-u.ac.jp)



Universidade do Minho
Escola de Engenharia

Universidade do Minho, Portugal
(<http://www.uminho.pt>)

Keynote Speakers

New Frontiers in Cloud Computing for Big Data and Internet-of-Things (IoT) Applications

Rajkumar Buyya^{1,2}

¹ Cloud Computing and Distributed Systems (CLOUDS) Lab,
The University of Melbourne, Australia

² Manjrasoft Pvt Ltd., Melbourne, Australia

Abstract. Computing is being transformed to a model consisting of services that are commoditised and delivered in a manner similar to utilities such as water, electricity, gas, and telephony. Several computing paradigms have promised to deliver this utility computing vision. Cloud computing has emerged as one of the buzzwords in the IT industry and turned the vision of “computing utilities” into a reality.

Clouds deliver infrastructure, platform, and software (application) as services, which are made available as subscription-based services in a pay-as-you-go model to consumers. Cloud application platforms need to offer

1. APIs and tools for rapid creation of elastic applications and
2. a runtime system for deployment of applications on geographically distributed computing infrastructure in a seamless manner.

The Internet of Things (IoT) paradigm enables seamless integration of cyber-and-physical worlds and opening up opportunities for creating newclass of applications for domains such as smart cities. The emerging Fog computing is extending Cloud computing paradigm to edge resources for latency sensitive IoT applications.

This keynote presentation will cover:

- a. 21st century vision of computing and identifies various IT paradigms promising to deliver the vision of computing utilities;
- b. opportunities and challenges for utility and market-oriented Cloud computing,
- c. innovative architecture for creating market-oriented and elastic Clouds by harnessing virtualisation technologies;
- d. Aneka, a Cloud Application Platform, for rapid development of Cloud/Big Data applications and their deployment on private/public Clouds with resource provisioning driven by SLAs;
- e. experimental results on deploying Cloud and Big Data/Internet-of-Things (IoT) applications in engineering, and health care, satellite image processing, and smart cities on elastic Clouds;

- f. directions for delivering our 21st century vision along with pathways for future research in Cloud and Fog computing.

Short Bio Dr. Rajkumar Buyya is a Redmond Barry Distinguished Professor and Director of the Cloud Computing and Distributed Systems (CLOUDS) Laboratory at the University of Melbourne, Australia. He is also serving as the founding CEO of Manjrasoft, a spin-off company of the University, commercializing its innovations in Cloud Computing. He served as a Future Fellow of the Australian Research Council during 2012-2016. He has authored over 625 publications and seven text books including “Mastering Cloud Computing” published by McGraw Hill, China Machine Press, and Morgan Kaufmann for Indian, Chinese and international markets respectively. He also edited several books including “Cloud Computing: Principles and Paradigms” (Wiley Press, USA, Feb 2011).

He is one of the highly cited authors in computer science and software engineering worldwide (h-index = 117, g-index = 255, 70,500 + citations). Dr. Buyya is recognized as a “Web of Science Highly Cited Researcher” in both 2016 and 2017 by Thomson Reuters, a Fellow of IEEE, and Scopus Researcher of the Year 2017 with Excellence in Innovative Research Award by Elsevier for his outstanding contributions to Cloud computing.

Software technologies for Grid and Cloud computing developed under Dr. Buyya’s leadership have gained rapid acceptance and are in use at several academic institutions and commercial enterprises in 40 countries around the world. Dr. Buyya has led the establishment and development of key community activities, including serving as foundation Chair of the IEEE Technical Committee on Scalable Computing and five IEEE/ACM conferences. These contributions and international research leadership of Dr. Buyya are recognized through the award of “2009 IEEE Medal for Excellence in Scalable Computing” from the IEEE Computer Society TCSC.

Manjrasoft’s Aneka Cloud technology developed under his leadership has received “2010 Frost & Sullivan New Product Innovation Award”. He served as the founding Editor-in-Chief of the IEEE Transactions on Cloud Computing. He is currently serving as Co-Editor-in-Chief of Journal of Software: Practice and Experience, which was established over 45 years ago. For further information on Dr. Buyya, please visit his cyberhome: www.buyya.com.

Approximation Problems for Digital Image Processing and Applications

Gianluca Vinti

Department of Mathematics and Computer Science,
University of Perugia, Italy

Abstract. In this talk, some approximation problems are discussed with applications to reconstruction and to digital image processing. We will also show some applications to concrete problems in the medical and engineering fields. Regarding the first, a procedure will be presented, based on approaches of approximation theory and on algorithms of digital image processing for the diagnosis of aneurysmal diseases; in particular we discuss the extraction of the pervious lumen of the artery starting from CT image without contrast medium. As concerns the engineering field, thermographic images are analyzed for the study of thermal bridges and for the structural and dynamic analysis of buildings, working therefore in the field of energy analysis and seismic vulnerability of buildings, respectively.

Short Bio Gianluca Vinti is Full Professor of Mathematical Analysis at the Department of Mathematics and Computer Science of the University of Perugia. He is Director of the Department since 2014 and member of the Academic Senate of the University. Member of the Board of the Italian Mathematical Union since 2006, member of the “Scientific Council of the GNAMPA-INdAM “(National Group for the Mathematical Analysis, the Probability and their Applications) since 2013, Referent for the Mathematics of the Educational Center of the “Accademia Nazionale dei Lincei” at Perugia since 2013 and Member of the Academic Board of the Ph.D. in Mathematics, Computer Science, Statistics organized in consortium (C.I.A.F.M.) among the University of Perugia (Italy), University of Florence (Italy) and the INdAM (National Institute of High Mathematics).

He is and has been coordinator of several research projects and he coordinates a research team who deals with Real Analysis, Theory of Integral Operators, Approximation Theory and its Applications to Signal Reconstruction and Images Processing.

He has been invited to give more than 50 plenary lectures at conferences at various Universities and Research Centers. Moreover he is author of more than 115 publications on international journals and one scientific monography on “Nonlinear Integral Operators and Applications” edited by W. de Gruyter. Finally he is member of the Editorial Board of the following international scientific journals: Sampling Theory in Signal and Image Processing (STSIP), Journal of Function Spaces and Applications, Open Mathematics, and others and he holds a patent entitled: “Device for obtaining informations on blood vessels and other bodily-cave parts”.

Contents – Part III

Workshop Econometrics and Multidimensional Evaluation in the Urban Environment (EMEUE 2018)

Decision Support Model for Conservation, Reuse and Valorization of the Historic Cultural Heritage	3
<i>Lucia Della Spina and Francesco Calabrò</i>	
Predicting Student Dropouts in Higher Education Using Supervised Classification Algorithms	18
<i>Antonella Serra, Paola Perchinunno, and Massimo Bilancia</i>	
A Procedure for Determining the Industrial Profitability of Settlement Interventions in the Appraisal of Exceptional Contribution of Urbanisation. . .	34
<i>Fabrizio Battisti and Orazio Campo</i>	
The Positioning of Italian Universities in the International Rankings	51
<i>Monica Cazzolle, Paola Perchinunno, and Vito Ricci</i>	
Performance Evaluation of Waste Materials in Construction for Sustainability	69
<i>Mercedes del Río Merino, Marica Sorrentino, Carmelo Maria Torre, and Paola Villoria-Sáez</i>	
Multi-Stakeholder Spatial Decision Analysis (M-SSDA) for a Culture-Led Regeneration Strategy	84
<i>Raffaella Amistà and Maria Cerreta</i>	

Workshop Future Computing Systems, Technologies, and Applications (FiSTA 2018)

Towards a User-Friendly Solution for Collaboratively Managing a Developed Ontology	103
<i>R. M. D. C. Rathnayaka, A. I. Walisadeera, M. D. J. S. Goonathilake, and A. Ginige</i>	
A Semi-automatic Approach to Collaboratively Populate an Ontology for Ontology-Illiterate Users	120
<i>R. A. O. M. P. D. Akmeemana, A. I. Walisadeera, M. D. J. S. Goonathilake, and A. Ginige</i>	
Concurrent Execution in Scripting Programming Language ‘mruby’	136
<i>Kazuaki Tanaka, Hiroyuki Maeda, and Hirohito Higashi</i>	

A Browser Application for Keyword Recommendation Based on User Web Search	147
<i>Chen Kuo and Noriaki Yoshiura</i>	
Local Clock Offset and Drift Estimation Between Neighbor Wireless Sensor Nodes	163
<i>Ayako Arao and Hiroaki Higaki</i>	
Toward a Secure VM Migration Control Mechanism Using Blockchain Technique for Cloud Computing Environment	177
<i>Toshihiro Uchibayashi, Bernady Apduhan, Takuo Suganuma, and Masahiro Hiji</i>	
Workshop Geographical Analysis, Urban Modeling, Spatial Statistics (GEO-AND-MOD 2018)	
Using Geographic Information System and Simulated Annealing for Optimizing the Railway Design	189
<i>Ali Mousanejad, Alireza Vafaeinejad, and Kamyar Eslami</i>	
Scenarios of Sediment Transport Management in Francia Creek, Valparaiso, Chile	205
<i>Vladimir J. Alarcon and Claudio Magrini</i>	
Safety of Physical Assets: A Ranking Method and Its GIS Implementation	219
<i>Paolino Di Felice, Luigi Pomante, and Antonello Di Felice</i>	
Spatial Data Warehouse and Spatial OLAP in Indoor/Outdoor Cultural Environments	233
<i>Mauro Mazzei and Salvatore Di Guida</i>	
Multiple Fabric Assessment: Focus on Method Versatility and Flexibility.	251
<i>Alessandro Araldi, Joan Perez, Giovanni Fusco, and Takashi Fuse</i>	
Web-Based GIS Platform for Automatic Prediction of Earthquakes	268
<i>Valeri G. Gitis and Alexander B. Derendyaev</i>	
GIS Applications in Costal Transport: The Co.Tr.I.S Case and Its Contribution Towards the Islands Sustainable Smartification	284
<i>Dimos N. Pantazis, Vassilios C. Moussas, Panagiotis Stratakis, Dimitris Stathakis, and Eleni Gkadolou</i>	
Building-Level Change Detection from Large-Scale Historical Vector Data by Using Direct and a Three-Tier Post-classification Comparison	300
<i>Masroor Hussain and Dongmei Chen</i>	

GPS-GIS for the Identification of a New Air Approach Path Through RNAV Procedure	317
<i>Vincenzo Barrile, Antonino Fotia, and Giuliana Bilotta</i>	
Building Extraction in High Spatial Resolution Images Using Deep Learning Techniques	327
<i>Ashvitha R. Shetty and B. Krishna Mohan</i>	
Servicification – Trend or Paradigm Shift in Geospatial Data Processing? . . .	339
<i>Andreas Fricke, Jürgen Döllner, and Hartmut Asche</i>	
Towards Automatic Assessment of Perceived Walkability	351
<i>Ivan Blečić, Arnaldo Cecchini, and Giuseppe A. Trunfio</i>	
Rockfall Source Areas Assessment in an Area of the Pollino National Park (Southern Italy).	366
<i>Rosalba Muzzillo, Lucia Losasso, and Francesco Sdao</i>	
Workshop Web-Based Collective Evolutionary Systems: Models, Measures, Applications (IWCES 2018)	
FAiR: A Framework for Analyses and Evaluations on Recommender Systems	383
<i>Diego Carvalho, Nicollas Silva, Thiago Silveira, Fernando Mourão, Adriano Pereira, Diego Dias, and Leonardo Rocha</i>	
Clustering Students Interactions in eLearning Systems for Group Elicitation	398
<i>Paolo Mengoni, Alfredo Milani, and Yuanxi Li</i>	
Community Graph Elicitation from Students' Interactions in Virtual Learning Environments	414
<i>Paolo Mengoni, Alfredo Milani, and Yuanxi Li</i>	
Workshop Large Scale Computational Physics (LSCP 2018)	
The Effects of Loss of Orthogonality on Large Scale Numerical Computations	429
<i>Christopher C. Paige</i>	
Simulation of Supernova Explosion Accelerated on GPU: Spherically Symmetric Neutrino-Radiation Hydrodynamics	440
<i>Hideo Matsufuru and Kohsuke Sumiyoshi</i>	
Practical Implementation of Lattice QCD Simulation on SIMD Machines with Intel AVX-512	456
<i>Issaku Kanamori and Hideo Matsufuru</i>	

Workshop Land Use Monitoring for Soil Consumption Reduction (LUMS 2018)

From the District Model to an Analysis by Specializations, Concentrations and Productive Clusters: The Localization of Economic Activities in Puglia	475
<i>Paola Perchinunno, Silvestro Montrone, and Carmelo Maria Torre</i>	
Post-normal Rationality in Assessment of Environmental Damage and Environmental Risk	490
<i>Carmelo Maria Torre, Pierluigi Morano, and Francesco Tajani</i>	
Urban Vulnerability Assessment: Towards a Cross-Scale Spatial Multi-criteria Approach	502
<i>Maria Cerreta, Roberta Mele, and Giuliano Poli</i>	

Workshop Mobile Communications (MC 2018)

Performance Analysis of Different Multiband RF Energy Harvesting Systems for Wireless Sensor Networks	521
<i>Saswati Ghosh and Debarati Sen</i>	
Efficient Video Delivery by Leveraging Playback Buffers over Software Defined Networking	531
<i>Joonbeom Ahn, Syed M. Raza, Sanggil Yeoum, and Hyunseung Choo</i>	
Personalized Service Degradation Policies on OTT Applications Based on the Consumption Behavior of Users	543
<i>Juan Sebastián Rojas, Álvaro Rendón Gallón, and Juan Carlos Corrales</i>	
Relay Selection Scheme for Cooperative Backscatter Communications Networks	558
<i>Daniyal Munir, Danish Mehmood Mughal, Tahira Mahboob, and Min Young Chung</i>	

Workshop Is a smart city really smart? Models, Solutions, Proposals for an Effective Urban and Social Development (Smart Cities 2018)

How has Cagliari Changed Its Citizens in Smart Citizens? Exploring the Influence of ITS Technology on Urban Social Interactions	573
<i>Mauro Coni, Chiara Garau, and Francesco Pinna</i>	
Understanding Kid-Friendly Urban Space for a More Inclusive Smart City: The Case Study of Cagliari (Italy).	589
<i>Alfonso Annunziata and Chiara Garau</i>	

Home-School Routes and Child Psychology: The Smartness in Small Steps	606
<i>Francesco Pinna, Mauro Coni, Francesca Maltinti, and Silvia Portas</i>	
Innovative Transport Systems to Promote Sustainable Mobility: Developing the Model Architecture of a Traffic Control and Supervisor System.	622
<i>Vincenza Torrisi, Matteo Ignaccolo, and Giuseppe Inturri</i>	
Smart City Governance Strategies to Better Move Towards a Smart Urbanism	639
<i>Margherita Azzari, Chiara Garau, Paolo Nesi, Michela Paolucci, and Paola Zamperlin</i>	
City Dashboards and the Achilles’ Heel of Smart Cities: Putting Governance in Action and in Space.	654
<i>Ginevra Balletto, Giuseppe Borruso, and Carlo Donato</i>	
Workshop Advances in Spatio-Temporal Analytics (ST-Analytics 2018)	
Spatial-HTM: A MapReduce-Based System for Querying Spatial Data with the Hierarchical Triangular Mesh	671
<i>Jiabao Yan, Haojia Zuo, Ying Zhao, and Yingyu Li</i>	
Author Index	683