

# **2015 IEEE 11th International Conference on e-Science (e-Science 2015)**

**Munich, Germany**  
**31 August – 4 September 2015**



**IEEE Catalog Number:** CFP1506A-POD  
**ISBN:** 978-1-4673-9326-3

# **2015 IEEE 11th International Conference on eScience**

## **eScience 2015**

### **Table of Contents**

Welcome from the General Chairs.....	xii
Committees.....	xiii
Program Committee.....	xiv

---

#### **Monday**

Adventures of Categories: Modelling the Evolution of Categories During Scientific Investigation .....	1
<i>Prashant Gupta, Mark Gahegan, and Gillian Dobbie</i>	
Beyond the Book: Linking Books to Wikipedia .....	12
<i>Carlos Martinez-Ortiz, Marijn Koolen, Floor Buschenhenke, and Karina van Dalen-Oskam</i>	
HEEM, a Complex Model for Mining Emotions in Historical Text .....	22
<i>Janneke M. van der Zwaan, Inger Leemans, Erika Kuijpers, and Isa Maks</i>	
Swedish eScience Education — A Graduate School in eScience .....	31
<i>Anders Hast, Michael Hanke, and Hans O. Karlsson</i>	
Using Text Similarity to Detect Social Interactions not Captured by Formal Reply Mechanisms .....	36
<i>Samuel Barbosa, Roberto M. Cesar-Jr, and Dan Cosley</i>	
Acceleration-as-a-Service: Exploiting Virtualised GPUs for a Financial Application .....	47
<i>Blesson Varghese, Javier Prades, Carlos Reaño, and Federico Silla</i>	
An Integrated Approach to Porting Large Scientific Applications to GPUs .....	57
<i>Ben van Werkhoven and Pieter Hijma</i>	
Application Support for Virtual GPGPUs in Grid Infrastructures .....	67
<i>John Walsh and Jonathan Dukes</i>	
TemPSS: A Service Providing Software Parameter Templates and Profiles for Scientific HPC .....	78
<i>Jeremy Cohen, Chris Cantwell, David Moxey, Jeremy Nowell, Peter Austing, Xu Guo, John Darlington, and Spencer Sherwin</i>	

Enabling SDMX-based Retrieval and Spatio-statistical Analysis of National Census and Related Datasets .....	88
<i>Jane Hunter, Imran Azeezullah, Nigel Ward, Ross Barker, Tung-Kai Shyy, Chris Beer, Stuart Girvan, Alister Nairn, Merry Branson, Robert Stimson, James Dentrinos, Gerson Galang, Stewart Wallace, and Chris Pettit</i>	
Finding Pulsars in Real-Time .....	98
<i>Alessio Sclocco, Henri E. Bal, and Rob V. van Nieuwpoort</i>	
From HPC Performance to Climate Modeling: Transforming Methods for HPC Predictions into Models of Extreme Climate Conditions .....	108
<i>Ryan McKinney, Vivek K. Palliparam, Rodrigo Vargas, and Michela Taufer</i>	
Multidisciplinary Collaboration to Facilitate Hypotheses Generation in Huntington's Disease .....	118
<i>Eleni Mina, Mark Thompson, Kristina M. Hettne, Willeke van Roon-Mom, Rajaram Kaliyaperumal, Eelke van der Horst, Katherine Wolstencroft, Barend Mons, and Marco Roos</i>	
Bootstrapping Complex Workflow Middleware Systems into the Cloud .....	126
<i>Karolina Vukojevic-Haupt, Florian Haupt, Frank Leymann, and Lukas Reinfurt</i>	
Cost-Aware Cloud Provisioning .....	136
<i>Ryan Chard, Kyle Chard, Kris Bubendorfer, Lukasz Lacinski, Ravi Madduri, and Ian Foster</i>	
Deployment of a Multi-site Cloud Environment for Molecular Virtual Screenings .....	145
<i>Anthony Nguyen, Andréa Matsunaga, Maurício Tsugawa, Susumu Date, Kohei Ichikawa, and Jason H. Haga</i>	
Federating Infrastructure as a Service Cloud Computing Systems to Create a Uniform E-infrastructure for Research .....	155
<i>David C. H. Wallom, Matteo Turilli, Michel Drescher, Diego Scardaci, and Steven Newhouse</i>	

## **Tuesday**

A Round Table for Multi-disciplinary Research on Geospatial and Climate Data .....	165
<i>Romulo Goncalves, Milena Ivanova, Foteini Alvanaki, Jason Maassen, Kostis Kyzirakos, Oscar Martinez-Rubi, and Hannes Mühleisen</i>	
eScience through the Integration of Data and Models: A Biodiversity Scenario .....	171
<i>Natalia Villanueva-Rosales, Luis Garnica Chavira, Nicholas del Rio, and Deana Pennington</i>	
FishGraph: A Network-Driven Data Analysis .....	177
<i>Patricia Cavoto, Victor Cardoso, Régine Vignes Lebbe, and André Santanchè</i>	

A Comparison of Background Subtraction Algorithms for Detecting Avian Nesting Events in Uncontrolled Outdoor Video .....	187
<i>Kyle Goehner, Travis Desell, Rebecca Eckroad, Leila Mohsenian, Paul Burr, Nicolas Caswell, Alicia Andes, and Susan Ellis-Felege</i>	
Discovering Loose Group Movement Patterns from Animal Trajectories .....	196
<i>Yuwei Wang, Ze Luo, Yan Xiong, Diann J. Prosser, Scott H. Newman, John Y. Takekawa, and Baoping Yan</i>	
WRF-ARW Model for Prediction of High Temperatures in South and South East Regions of Armenia .....	207
<i>H. Astsatryan, A. Shakhnazaryan, V. Sahakyan, Yu. Shoukourian, V. Kotroni, Z. Petrosyan, R. Abrahamyan, and H. Melkonyan</i>	
Desktop as a Service Supporting Environmental 'omics .....	214
<i>David C. H. Wallom, Timothy Booth, Andy Bowery, Ben Collier, Phillip Kershaw, Anurag Priyam, Yannick Wurm, and Dawn Field</i>	
Live ANDES: Mobile-Cloud Shared Workspace for Citizen Science and Wildlife Conservation .....	215
<i>Cristian Bonacic, Andres Neyem, and Andrea Vasquez</i>	
VERCE Delivers a Productive E-science Environment for Seismology Research .....	224
<i>Malcolm Atkinson, Michele Carpené, Emanuele Casarotti, Steffen Claus, Rosa Filgueira, Anton Frank, Michelle Galea, Tom Garth, André Gemünd, Heiner Igel, Iraklis Klampanos, Amrey Krause, Lion Krischer, Siew Hoon Leong, Federica Magnoni, Jonas Matser, Alberto Michelini, Andreas Rietbrock, Horst Schwichtenberg, Alessandro Spinuso, and Jean-Pierre Vilotte</i>	
Acoustic Feature Extraction Using Perceptual Wavelet Packet Decomposition for Frog Call Classification .....	237
<i>Jie Xie, Michael Towsey, Philip Eichinski, Jinglan Zhang, and Paul Roe</i>	
Summer in the City: Forecasting and Mapping Human Thermal Comfort in Urban Areas .....	243
<i>J. J. Attema, B. G. Heusinkveld, R. J. Ronda, G. J. Steeneveld, and A. A. M. Holtslag</i>	
Transforming Geodata for Immersive Visualisation .....	249
<i>Markus Wiedemann, Christoph Anthes, Hans-Peter Bunge, Bernhard S.A. Schuberth, and Dieter Kranzlmüller</i>	

## **Poster Session**

Data Access and Reproducibility in Privacy Sensitive eScience Domains .....	255
<i>Stefan Pröell, Rudolf Mayer, and Andreas Rauber</i>	
Applying a Multi-dimensional Time-Series Similarity Method to Typhoon-track Prediction .....	259
<i>Yu Fang, Kosuke Sugano, Kenta Oku, and Kyoji Kawagoe</i>	

Autocuration Cyberinfrastructure for Scientific Discovery and Preservation .....	264
<i>Smruti Padhy, Edgar Black, Betsy Cowdery, Liana Diesendruck, Michael Dietze, Greg Jansen, Rob Kooper, Praveen Kumar, Jong Lee, Rui Liu, Richard Marciano, Luigi Marini, Dave Mattson, Barbara Minsker, Chris Navarro, Ankit Rai, Marcus Slavenas, William Sullivan, Jason Votava, Qina Yan, Inna Zharnitsky, and Kenton McHenry</i>	
Building an Institution Digital Repository: The ASI Science Data Center Bibliography Tool .....	268
<i>Federica Moscato, Cristina Leto, and Paolo Giommi</i>	
Classifying Bone Trabecular Volumes Using 3D Shape Descriptors .....	271
<i>Manuel Herrera, Carlos Martinez-Ortiz, Patricia Carvalho-Lobato, and Maria-Cristina Manzanares-Cespedes</i>	
CloudBench — A Framework for Distributed, Self-organizing, Continuous and Topology-aware IaaS Cloud Benchmarking with Super-peer Networks .....	273
<i>Peter Krauss, Tobias Kurze, and Achim Streit</i>	
Computer-Assisted Workflow Composition Based on Virtual Simulation Objects Technology .....	279
<i>Pavel A. Smirnov and Sergey V. Ivanov</i>	
Constructing Scalable Data-Flows on Hadoop with Legacy Components .....	283
<i>Rainer Schmidt, Matthias Rella, and Sven Schlarb</i>	
Forecasting Auroral Substorms from Observed Data with a Supervised Learning Algorithm .....	284
<i>Takanori Tanaka, Daisuke Kitao, Yuka Sato, Yoshimasa Tanaka, and Daisuke Ikeda</i>	
Interactive Analytic Systems for Understanding the Scholarly Impact of Large-Scale E-science Cyberenvironments .....	288
<i>Krishna Madhavan, Daniel F. Mejia, Hanjun Xian, Lynn K. Zentner, Victoria A. Farnsworth, Swaroop Samek, and Gerhard Klimeck</i>	
Negotiation Protocol for Agile and Reliable E-science Collaboration .....	292
<i>Zeqian Meng and John Brooke</i>	
Presenting the Cloud as Files and Directories .....	296
<i>Vitalian A. Danciu</i>	
Provenance-driven Representation of Crowdsourcing Data for Efficient Data Analysis .....	300
<i>Carlos Martinez-Ortiz, Lora Aroyo, Oana Inel, Stavros Champilomatis, Anca Dumitrasche, and Benjamin Timmermans</i>	
Shape Optimisation of Architectural Shell with Algae Photoreactors .....	304
<i>Natalia Buzalo and Pavel Ermachenko</i>	
Web-Based Manipulation of Multiresolution Micro-CT Images .....	308
<i>Lasse Wollatz, Simon Cox, and Steven Johnston</i>	

## **Wednesday**

A Quantitative Study on the Re-executability of Publicly Shared Scientific Workflows .....	312
<i>Rudolf Mayer and Andreas Rauber</i>	
Data Analytics in Bioinformatics: Data Science in Practice for Genomics Analysis	
Workflows .....	322
<i>Kary A. C. S. Ocaña, Vitor Silva, Daniel de Oliveira, and Marta Mattoso</i>	
Scaling Up Bioinformatics Workflows with Dynamic Job Expansion: A Case Study	
Using Galaxy and Makeflow .....	332
<i>Nicholas Hazekamp, Joseph Sarro, Olivia Choudhury, Sandra Gesing, Scott Emrich, and Douglas Thain</i>	
Streaming Algorithms for Halo Finders .....	342
<i>Zaoxing Liu, Nikita Ivkin, Lin Yang, Mark Neyrinck, Gerard Lemson, Alexander Szalay, Vladimir Braverman, Tamas Budavari, Randal Burns, and Xin Wang</i>	
A Task-Centered Framework for Computationally-Grounded Science Collaborations .....	352
<i>Yolanda Gil, Felix Michel, Varun Ratnakar, Matheus Hauder, Christopher Duffy, Hilary Dugan, and Paul Hanson</i>	
Cloud-based E-Infrastructure for Scheduling Astronomical Observations .....	362
<i>James Wetter, Özgür Akgun, Adam Barker, Martin Dominik, Ian Miguel, and Blesson Varghese</i>	
Managing Complexity in Distributed Data Life Cycles Enhancing Scientific Discovery .....	371
<i>Richard Grunzke, Alvaro Aguilera, Wolfgang E. Nagel, Jens Krüger, Sonja Herres-Pawlis, Alexander Hoffmann, and Sandra Gesing</i>	
Monitoring of Upper Limb Rehabilitation and Recovery after Stroke: An Architecture for a Cloud-Based Therapy Platform .....	381
<i>Simon Woodman, Hugo Hiden, Mark Turner, Stephen Dowsland, and Paul Watson</i>	
Genome Analysis in a Dynamically Scaled Hybrid Cloud .....	391
<i>Christopher Smowton, Georgiana Copil, Hong-Linh Truong, Crispin Miller, and Wei Xing</i>	
Globus Data Publication as a Service: Lowering Barriers to Reproducible Science .....	401
<i>Kyle Chard, Jim Pruyne, Ben Blaiszik, Rachana Ananthakrishnan, Steven Tuecke, and Ian Foster</i>	
Identification of Biomarkers and Signatures in Protein Data .....	411
<i>Torbjörn E. M. Nordling, Narendra Padhan, Sven Nelander, and Lena Claesson-Welsh</i>	
Porting Ordinary Applications to Blue Gene/Q Supercomputers .....	420
<i>Ketan Maheshwari, Justin M. Wozniak, Timothy G. Armstrong, Daniel S. Katz, T. Andrew Binkowski, Xiaoliang Zhong, Olle Heinonen, Dmitry Karpeyev, and Michael Wilde</i>	
Searching the Human Genome for Snail and Slug with DNA@Home .....	429
<i>Kristopher Zarns, Travis Desell, Sergei Nechaev, and Archana Dhasarathy</i>	

A Multipath Controller for Accelerating GridFTP Transfer over SDN .....	439
<i>Che Huang, Chawanat Nakasan, Kohei Ichikawa, and Hajimu Iida</i>	
B2SHARE: An Open eScience Data Sharing Platform .....	448
<i>Sarah Berenji Ardestani, Carl Johan Håkansson, Erwin Laure, Ilja Livenson, Pavel Straňák, Emanuel Dima, Dennis Blommesteijn, and Mark van de Sanden</i>	
dispel4py: An Agile Framework for Data-Intensive eScience .....	454
<i>Rosa Filgueira, Amrey Krause, Malcolm Atkinson, Iraklis Klampanos, Alessandro Spinuso, and Susana Sanchez-Exposito</i>	
MemEFS: An Elastic In-memory Runtime File System for eScience Applications .....	465
<i>Alexandru Uta, Andreea Sandu, Stefania Costache, and Thilo Kielmann</i>	
SODA: Science-Driven Orchestration of Data Analytics .....	475
<i>Jai Dayal, Jay Lofstead, Greg Eisenhauer, Karsten Schwan, Matthew Wolf, Hasan Abbasi, and Scott Klasky</i>	

## **First International Workshop on Interoperable Infrastructures for Interdisciplinary Big Data Sciences (IT4RIs 15)**

Towards Sustainable Curation and Preservation: The SEAD Project's Data Services Approach .....	485
<i>James Myers, Margaret Hedstrom, Dharma Akmon, Sandy Payette, Beth A. Plale, Inna Kouper, Scott McCaulay, Robert McDonald, Isuru Suriarachchi, Aravindh Varadharaju, Praveen Kumar, Mostafa Elag, Jong Lee, Rob Kooper, and Luigi Marini</i>	
Enhanced Usability of Managing Workflows in an Industrial Data Gateway .....	495
<i>Gary A. McGilvary, Malcolm Atkinson, Sandra Gesing, Alvaro Aguilera, Richard Grunzke, and Eva Sciacca</i>	
A Semantic Peer to Peer Network to Support e-Science .....	503
<i>Tadeu Classe, Regina Braga, Fernanda Campos, and José Maria Nazar David</i>	
Open Information Linking for Environmental Research Infrastructures .....	513
<i>Paul Martin, Paola Grosso, Barbara Magagna, Herbert Schentz, Yin Chen, Alex Hardisty, Wouter Los, Keith Jeffery, Cees de Laat, and Zhiming Zhao</i>	
WIP: Provenance Support for Interdisciplinary Research on the North Creek Wetlands .....	521
<i>Qi Zhang, Jonathan Mason, Morteza Chini, Karen Potts, Nathan Duncan, Delmar B. Davis, and Hazeline U. Asuncion</i>	
Interoperability Oriented Architecture: The Approach of EPOS for Solid Earth e-Infrastructures .....	529
<i>Daniele Bailo, Keith G. Jeffery, Alessandro Spinuso, and Giuseppe Fiameni</i>	
A Community Contribution Framework for Sharing Materials Data with Materials Project .....	535
<i>Patrick Huck, Anubhav Jain, Dan Gunter, Donald Winston, and Kristin Persson</i>	

Multi-node Multi-agent Cloud Simulation: Approximating Synchronisation .....	542
<i>Antonio Giardina, Yun Yang, Hai Vu, and Rajesh Vasa</i>	
Reference Model Guided System Design and Implementation for Interoperable Environmental Research Infrastructures .....	551
<i>Zhiming Zhao, Paul Martin, Paola Grossi, Wouter Los, Cees de Laat, Keith Jeffrey, Alex Hardisty, Alex Vermeulen, Donatella Castelli, Yannick Legré, and Werner Kutsch</i>	
<b>First Workshop on E-science ReseaRch leading tO negative Results (ERROR)</b>	
Scientific Workflow Interchanging through Patterns: Reversals and Lessons Learned .....	557
<i>Bruno Fernandes Bastos, Regina Maria Maciel Braga, and Antônio Tadeu Azevedo Gomes</i>	
From Thread to Transcontinental Computer: Disturbing Lessons in Distributed Supercomputing .....	565
<i>Derek Groen and Simon Portegies Zwart</i>	
Early Experiences with Separate Caches for Private and Shared Data .....	572
<i>Juan M. Cebrián, Alberto Ros, Ricardo Fernández-Pascual, and Manuel E. Acacio</i>	
A Ping Too Far: Real World Network Latency Measurement .....	580
<i>Gary Jackson, Pete Keleher, and Alan Sussman</i>	
<b>Author Index</b> .....	589