



**Chapman University Symposium on Big Data and Analytics:
44th Symposium on the Interface of Computing Science and Statistics**

Theme:

Data Science Theory and Practice

Subthemes:

Earth Systems Science Data and Health Care Data Systems

April 4-6, 2013

Program Chair:

Hesham El-Askary, Chapman University

Associate Professor of Remote Sensing and Earth System Science

School of Earth and Environmental Sciences, Schmid College of Science and Technology
Director, Hazards, Global and Environmental Change and Computational Sciences Graduate
Programs

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Thursday April 4th 2013: Sandhu Conference Center

7:30 am – 1:30 pm

Registration

8:30 am – 10:00 am

Technical Sessions

- **Astroinformatics: Learning from Data in the Astronomical Sciences 1**

Chair: Kirk Borne, George Mason University

1. *Citizen Science and Astroinformatics - Data Science at the Frontiers of Astronomy*
Kirk Borne, George Mason University
2. *Crowd Sourcing vs. Computational Intelligence - Some Lessons from the Zooniverse*
John Wallin, Middle Tennessee State University
3. *Filtergraph: An Innovative Online Portal for Rapid and Intuitive Visualization of Massive Multi-Dimensional Datasets*
Dan Burger, Vanderbilt University

- **Data Science and Climate 1**

Chair: Amy Braverman, JPL

1. *Low-Rank Spatial Models for Large Remote-Sensing Datasets*
Matthias Katzfuss, University of Heidelberg
2. *Likelihood-based Climate Model Evaluation*
Amy Braverman, Jet Propulsion Laboratory
3. *Informing climate retrieval development using data mining*
Lukas Mandrake, Jet Propulsion Laboratory

10:00 am – 11:30 pm

Technical Sessions

- **Learning from Data**

Convener: James Gentle, George Mason University

Chair: Kirk Borne, George Mason University

1. *Learning from Data, Big and Small*
Kirk Borne, George Mason University
2. *Leveraging as a Paradigm for Statistically-Informed Large-Scale Computation*
Michael Mahoney, Stanford
3. *Machine Learning Explorations of Citizen Science Data*
Arun Vedachalam, George Mason University

- **From Large Earth Science Datasets to Compelling Scientific Results**

Chair: Charles Ichoku, NASA GSFC

1. *Experience in Extracting Scientific Information from the Data Collected by Back-Scattered Ultraviolet (BUV) Instruments Flown on Satellites Since 1970*
Pawan K. Bhartia and Joanna Joiner, NASA GSFC
2. *Assessment of aerosol intercontinental transport with big data from EOS satellites*
Hongbin Yu, NASA GSFC
3. *Implications of Satellite Swath Width on Aerosol Optical Thickness Statistics*
Peter Colarco, NASA GSFC
4. *Improving our Understanding of Land-Use Change and Fire in Southeast Asia by Using Advanced Mathematical Techniques, Models, and Multiple Remotely Sensed Measurements in Tandem*
Jason Blake Cohen, National University of Singapore

11:30 pm – 1:15 pm **Lunch Break and Poster Session**
(Provided: Beckman Center 404)

1:15 pm – 1:45 pm Official Opening, Introductions and Welcoming Notes

- *Introductions* Hesham El-Askary, Interface 2013 Chair, Chapman University
- *Welcoming Remarks* James Doti, President Chapman University
- *Welcoming Remarks* Janeen Hill, Dean Schmid College of Science and Technology
- *Welcoming Remarks* Menas Kafatos, Director Center of Excellence in Earth Systems Modeling & Observations, on behalf of Chancellor, Chapman University

1:45 pm – 2:45 pm Panel Discussion by Experian: *The Future of Digital Wallets*
Moderator: **Mark Kapczynski, VP, Strategy, Experian Consumer Services**

1. *Panelist 1*: Dan Elvester, Director, Business Development, Experian Decision Analytics
2. *Panelist 2*: JP Voisinet, Strategy Associate, Experian Consumer Services
3. *Panelist 3*: Wences Casares, CEO, Lemon Wallet
4. *Panelist 4*: Andy Johnson, SVP Data, Experian Marketing Services
5. *Panelist 5*: Eric Haller, SVP, Data Lab, Experian

2:45 pm – 3:20 pm Keynote Speaker 1: **Edward Wegman, George Mason University**
Title: *Big Data: Technology and Analysis*

3:20 pm – 3:30 pm Q&A

3:30 pm – 3:55 pm **Afternoon Break**

4:00 pm – 4:50 pm Keynote Speaker 2: **Tarek El-Ghazawi, George Washington University**

Title: *Processing Big Data and Crunching Numbers for Big Simulations- The Advances in High-Performance Computing*
4:50 pm – 5:00 pm Q&A
5:00 pm – 5:50 pm Keynote Speakers 3&4: **John Vigouroux and Michael Goldsby, Frost Venture Partners**
Title: *The Changing Role of Big Data in Healthcare*
5:50 pm – 6:00 pm Q&A

(Beckman Center 404)
6:00 pm – 8:00 pm **Networking and Opening Reception**

Friday April 5th 2013:

Sandhu Conference Center (Data Theory and Earth Science Sessions) **Argyros Forum 209 A, B, C** (Health Care Sessions)

7:30 am – 8:00 am **Registration**
8:00 am – 9:30 am **Technical Sessions**

- **Astroinformatics: Learning from Data in the Astronomical Sciences 2**
Chair: Kirk Borne, George Mason University
 1. *Things that go *Bang!* in the Night: Automated Classification of Transient Events in Sky Surveys*
George Djorgovski, California Institute of Technology
 2. *Find Rare Astronomical Objects Using Efficient Bayesian Networks*
Ashish Mahabal, California Institute of Technology
 3. *Data Triage of Astronomical Transients and Variables: A Machine Learning Approach*
Umaa Rebbapragada, Jet Propulsion Laboratory
 4. *Application of PCA to the Atmospheres of Jupiter and Saturn: Temporal and Seasonal Changes*
Padma Yanamandra-Fisher, Space Science Institute
- **Data Science and Climate 2**
Chair: Amy Braverman, JPL
 1. *Statistical Downscaling of Global Climate Model Wind Fields*
Mark Nakamura, University of California, Los Angeles

2. *Understanding Climate Change - Opportunities and Challenges for Data Driven Research*
Vipin Kumar, University of Minnesota
 3. *A Software Architecture for the Systematic Analysis of Climate Science Data*
Dan Crichton, Jet Propulsion Laboratory
- **Healthcare Process Reform**
Chair: Arnold Goodman, Collaborative Data Solutions
 1. *Process Analysis of Healthcare to Better Manage Stakeholder Goals, Funding, Engineering, Delivery, Culture, Big Data and Accountability*
Arnold Goodman, Collaborative Data Solutions
 2. *Benchmarking Healthcare Provider Performance: Some Statistical Considerations*
Susan Paddock, RAND Corporation
 3. *Make More Accurate Genomic Conclusions from Sequence Findings by Reducing a Basic Uncertainty in Associating Genes with Diseases*
Arnold Goodman, Collaborative Data Solutions

9:30 am – 11:00 am

Technical Sessions

- **JCGS Highlights at the Interface Auditorium**
Chair: Richard Levine, JCGS Editor, San Diego State University
 1. *Optimization Algorithms for Convex Clustering*
Eric Chi, University of California, Los Angeles
 2. *Tapered Covariance: Bayesian Estimation and Asymptotics*
Benjamin Shaby, University of California, Berkeley
 3. *A Discussion of Graphical Inference*
Heike Hofmann, Iowa State University
- **Analysis of Big Data for Atmospheric Aerosol Research**
Chair: Olga Kalashnikova, Jet Propulsion Laboratory
Co-Chair: Michael Garay, Jet Propulsion Laboratory
 1. *Scientific Discovery and Anomaly Detection in Large Aerosol Data Sets*
Kiri Wagstaff, Jet Propulsion Laboratory
 2. *Giovanni-4: the next generation of an online tool for satellite data visualization, exploration and inter-comparison*
Christopher Lynnes, NASA/GSFC
 3. *Applying Spatial Statistical Data Fusion on MISR and MODIS Aerosol Data*
Hai Nguyen, Jet Propulsion Laboratory
- **Healthcare Futures**
Chair: Mark Kapczynski, VP, Strategy, Experian Consumer Services
 1. *Panelist 1*: Dan Johnson, President, Experian Healthcare
 2. *Panelist 2*: Anatoly Kvitnitsky, Strategy Associate, Experian Consumer Services

3. *Panelist 3*: John Benson, CEO Verisys
4. *Panelist 4*: Katie Vahle, CEO, CoPatient
5. *Panelist 5*: Greg Jackson, Chief Data Officer, EverydayHealth

11:00 am – 11:30 pm **Morning Break**
 11:30 pm – 1:00 pm **Technical Sessions**

- **Educating Data Scientists**

Chair: Hadley Wickham, Rice University

1. *Research and Teaching for Large Complex Data Must Integrate the Components of Data Science: The Divide and Recombine (D&R) Illustration*
William Cleveland, Purdue University
2. *Statistics Education Under the Data Deluge*
Rob Gould, University of California, Los Angeles
3. *Designing the Data Science Curriculum*
Jeff Hammerbacher, Cloudera

- **Statistical Learning in Earth Systems Science**

Convener: David A. Van Dyk, Imperial College London

Chair: Richard Levine, JCGS Editor, San Diego State University

1. *Co-clustering Spatial Data Using a Generalized Linear Mixed Model With Application to the Integrated Pest Management*
Daniel Jeske, University of California, Riverside
2. *Using state-space models for variance matrices to study climate patterns*
Yaming Yu, University of California, Irvine
3. *Nonlinear Models for Predicting Plankton Ecosystem Dynamics*
Barbara Bailey, San Diego State University

- **Application of Big Data and Analytics to the Healthcare Setting (Panel Discussion)**

Chair: Janeen Hill, Chapman University

1. *Panelist 1*: Paea LePendou, Stanford Center for Biomedical Informatics Research (BMIR)
2. *Panelist 2*: Lorraine Fernandes, Information Management, IBM
3. *Panelist 3*: Graham Nixon, Chief Health Informatics Officer, Veteran Affairs San Diego Healthcare System
4. *Panelist 4*: Charles Boicey, Informatics Solutions Architect, UC Irvine Health

1:00 pm – 2:30 pm **Lunch Break and Poster session**
(Provided: Beckman Center 404)

Lunch: Keynote Speaker: *Earth Systems Science Data* **Jack Kaye, NASA**

Title: *Earth System Science: Data Challenges Created by Observations and Models, and their use for Science and Applications*

2:30 pm – 4:00 pm

Technical Sessions

- **Cloud Computing and Big Data**

Chair: Michael Fahy, Chapman University

1. *R²: R and SAS collaboration in the cloud*
James Harner, West Virginia University
2. *Cloud-Enabled Processing & Exploitation of Remotely Sensed Data*
Michael Limcaco, Amazon Web Services
3. *An Introduction to Hadoop for Big Data Applications*
Gayn B. Winters, Technical Program Manager, Technology Consultants

- **Climate Data Analysis: From Satellites to Climate Models**

Chair: Robert Allen, University of California, Riverside

1. *Heterogeneous Warming Agents and Widening of the Tropical Belt*
Robert Allen, University of California, Riverside
2. *The Future of Model Evaluation*
Charlie Zender, University of California, Irvine
3. *Statistical correction of satellite cloud data for climate change studies*
Joel Norris, Scripps Institution of Oceanography, University of California, San Diego
4. *NASA-Unified Weather Research Forecasting Model coupled with the Goddard Satellite Data Simulator Unit: Multi-Satellite Radiance-Based Evaluation of Fully Coupled Regional Atmospheric Model*
Toshihisa Matsui, NASA GSFC

- **Big Data Challenges in Bioinformatics and Medical Informatics**

Organizer: Nadim Alkharouf, Towson University

Chair: Ian Misner, Towson University

1. *Big Data Challenges in the Sequencing of plant pathogen Genomes*
Ian Misner, Towson University
2. *Speeding-Up Codon Analysis on the Cloud with Local MapReduce Aggregation*,
Atanas Radenski & Louis Ehwerhemuepha, Chapman University
3. *Translational Bioinformatics and Quantitative Biology in Cancer Research: From Big Data Molecular Analysis of Human Disease to Personalized Medicine*,
Gennady Verkhivker, Chapman University

(Beckman Center 404)

4:15 pm – 5:15 pm Panel Discussion by NEXUS IS: *Applied Analytics in the Enterprise*

Moderator: Kevin Griffith, NEXUS IS

1. *Panelist 1*: Colin McNamara, Chief Cloud Architect
2. *Panelist 2*: Paul Caracciolo, Chief Healthcare Officer

5:15 pm – 7:00 pm (NEXUS IS Sponsored Reception)

Saturday April 6th 2013: Sandhu Conference Center

7:30 am – 8:00 am

Registration

8:00 am – 9:30 am

Technical Sessions

- **Random Solutions to Big Problems**

Co-Chairs: Eric C. Chi, University of California, Los Angeles and Miles Lopes, University of California, Berkeley

1. *Implementing Randomized Matrix Algorithms in Parallel and Distributed Environments*
Michael Mahoney, Stanford
2. *A More Powerful Two-Sample Test in High Dimensions using Random Projection*,
Miles Lopes, University of California, Berkeley
3. *Perturb-and-MAP Random Fields: The Interplay Between Random Sampling and Optimization*
George Papandreou, University of California, Los Angeles

- **From Large Earth Science Datasets to Compelling Scientific Results**

Chair: Mian Chin, NASA GSFC

1. *Where does it come from, where does it go? Constraining sources and distributions of atmospheric pollutants with satellite data*
Daven Henze, University of Colorado
2. *Satellite and Model Data to Support Air Quality Management*
Tracey Holloway, University of Wisconsin, Madison
3. *Trends in Extreme United States Temperatures*
Jaechoul Lee, Boise State University

9:30 am – 11:00 am

Technical Sessions

- **Visualization of Big Data**

Convener: Juergen Symanzik, Utah State University

Chair: Edward Wegman, George Mason University

1. *Interactive Visualization of Big Data*
Simon Urbanek, AT&T Research Labs
2. *Divide and Recombine (D&R) for Comprehensive Visualization of Large Complex Data at Their Finest Granularity*
William Cleveland, Purdue University
3. *Visualization of "Big Data" in Molecular and Genomic Sciences*

Nicholas Lewin-Koh, Genentech

- **From Large Earth Science Datasets to Compelling Scientific Results**

Chair: Hesham El-Askary, Chapman University

1. *Satellite observations and computational analysis synergies: aerosol smoke plume heights and impacts of fires on air quality*
Maria Val Martin, Colorado State University
2. *Detailed global evaluation of aerosol measurements from multiple satellite sensors*
Charles Ichoku, NASA GSFC
3. *Multi-decadal variations of aerosols from multi-platform data and model from 1980 to 2009*
Mian Chin, NASA GSFC

11:00 pm – 11:30 pm

Morning Break

11:30 pm – 1:00 pm

Technical Sessions

- **Data Science Methods**

Chair: Edward Wegman, George Mason University

1. *Multivariate Wavelet Density Estimation for Streaming Data – A parallel programming approach*
Kyle Caudle, South Dakota School of Mines and Technology
2. *Depth Functions and Multidimensional Medians on Proximity Graphs*
Mengta Dan Yang, George Washington University
3. *Near k -Regular Graphs and Hamiltonian Cycles.*
Yang Xu, George Mason University

- **Massive Data Challenges in Numerical Weather Modeling**

Chair: Menas Kafatos, Chapman University

1. *Evaluation of surface climate fields in the NARCCAP hindcast experiment using JPL Regional Climate Model Evaluation System*
Jinwon Kim, University of California, Los Angeles
2. *Use of variable resolution gridding in the Ocean-Land-Atmosphere Model (OLAM) for optimal utilization of resources on large and small computers*
Robert Walko, University of Miami
3. *Computational Aspects of Regional Climate and Weather Forecasting Applications*
Craig Tremback, President ATMET, LLC
4. *Development of an Integrated Prediction System for Climate-Environment-Ecosystem Interactions and Corresponding GIS-based Database and Web Display System*
Seon K. Park, Ehwa University, Korea

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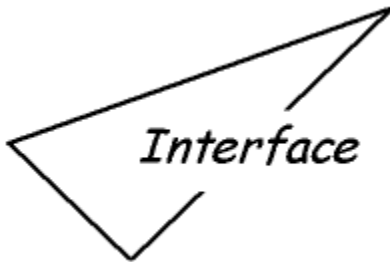


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