Unlocking the Power of

BIG DATA in Health

Bringing Innovation into
Improved Care and Prevention

UNIVERSITY OF
South Carolina

PROGRAM
SCHEDULE

UofSC **Big Data Health Science Center**

National Big Data Health Science Conference 2021

Virtual **February 5-6, 2021**

Unlocking the Power of BIG DATA in Health

Bringing Innovation into Improved Care and Prevention

The University of South Carolina Big Data Health Science Center ([BDHSC](#)) is pleased to announce its **2021 Big Data Health Science Conference**!

Highlights of the virtual conference include keynote and panel speakers from diverse areas of the health sciences, government, and academia. Our decision to move the conference to a virtual format means attendees will have the ability to attend poster sessions, networking events, and breakout sessions in areas of electronic health records, geospatial, social media, genomics, and bionanomaterial research from the safety and comfort of their homes and offices.

2021 Big Data Health Science Conference Sponsor:

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To attend the conference, please log in at

https://event.vconferenceonline.com/microsite/html/event.aspx?id=1998

On February 5-6, 2021

All registered attendees should receive an email with their usernames and passwords.
If you need assistance, please contact Miranda Cole at mc95@mailbox.sc.edu

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U of SC Big Data Health Science Center
University of South Carolina

HOME   EVENT SUMMARY

Unlocking the Power of
BIG in **Health**
DATA Bringing Innovation into Improved Care and Prevention
FEBRUARY 5-6, 2021

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PROGRAM SCHEDULE
Friday, February 5, 2021

Plenary Presentations | 9:00am – 12:00pm (EST)
Virtual Room: Richland

9:00am – 9:15am   **Welcome and Opening Remarks**

Robert L. Caslen Jr., President, UofSC

G. Thomas Chandler, Dean of Arnold School of Public Health, UofSC

9:15am – 9:30am   **Student Case Competition Award Announcement**

9:30am – 9:45am   **Tea Break**

9:45am – 10:30am   *Using Data Science to Address a Global Pandemic*

Summary: Dr. Susan Gregurick, NIH Associate Director for Data Science, will discuss NIH's coordinated data approach to addressing COVID-19 that is focused on enhanced data, interoperability, and discoverability. Dr. Gregurick will also highlight additional data science milestones that have happened alongside rapid progress in responding to a global pandemic.

Susan Gregurick (NIH)

10:30am – 11:15am   *Big Biomedical Data Analysis Using Ontology and AI Technologies*

Cui Tao (University of Texas)

11:15am – 12:00pm   *COVID-19 in South Carolina: Applying A Big Data Science Driven Approach*

Bankole Olatosi (UofSC)

Poster Presentation Q&A | 12:00pm – 1:00pm (EST)
Virtual Room: Exhibition Hall

Breakout Sessions (Set 1) | 1:00pm – 3:00pm (EST)
Electronic Health Records Session I
Virtual Room: Richland

The Promise of Big Data in Health Care: Improving Diagnosis, Treatment, and Outcomes

Session Summary: The multiple, massive, and rich Big Data streams in healthcare and the emergence of advanced information and computational technologies (e.g., machine learning and artificial intelligence) offer an invaluable opportunity for applying innovative Big Data science research in health care settings. This session focuses on how to identify individuals and communities at high risk and prioritize them for early public health interventions and how to model the disease progression using the electronic health records data, including administrative and billing data, electronic medical records, or other digital records of information pertinent to individual or population health and Web and social media data.

Moderator Jiajia Zhang (UofSC)

Presentation 1 *Leveraging Different Approaches in Big Data and Machine Learning to Conduct Infoveillance Studies for the COVID-19 Pandemic*

Timothy Mackey (University of California)

Presentation 2 *Harnessing Network Medicine for Drug Repurposing in COVID-19*

Feixiong Cheng (Case Western Reserve University and Genomic Medicine Institute, Cleveland Clinic)

Presentation 3 *Artificial Intelligence-Enabled Rapid Diagnosis of Patients with COVID-19*

Yang Yang (Icahn School of Medicine at Mount Sinai)

Presentation 4 *Using Real World Data For Personalized Treatment Effects: Heterogeneity In The Benefits of Oral Antidiabetic Medications*

Jeffrey McCullough (University of Michigan)

Friday, February 5, 2021

Breakout Sessions (Set 1) | 1:00pm — 3:00pm (EST)
Geospatial Session
Virtual Room: Lexington

Health Geography and Infectious Disease

Session Summary: This session features a multidisciplinary group of faculty discussing the importance of geographic information in analyzing communicable disease data and related risk factors. In addition, all presentations with highlight the implications of Big Data for geospatial COVID-19 research.

Moderator Jan Eberth (UofSC)

Presentation 1

Understanding the G in Geospatial Analyses of the COVID-19 pandemic

Susan Cutter (UofSC)

Presentation 2

Social Determinants of Health Data in AIDSVu: A New Public Health Data Resource

Patrick Sullivan (Emory University)

Presentation 3

Staying Connected while Social Distant: A Spatial Analysis of Broadband Access and Implications for Peri-Pandemic and Post-Pandemic Times

Whitney Zahnd (UofSC)

Presentation 4

Monitoring the Spatial Spread of COVID-19 and Effectiveness of the Control Measures through Human Movement using Big Social Media Data

Zhenlong Li (UofSC)

Friday, February 5, 2021

Breakout Sessions (Set 1) | 1:00pm — 3:00pm (EST)
Social Media Session
Virtual Room: Greenville

Mining Social Media Big Data for Health Applications

Session Summary: Public health focuses on monitoring and assessing a population health and crafting health policies to address the identified health problems. Traditionally, public health draws data from surveys that have long been the backbone of public health activities. However, surveys are expensive and time-consuming. Social media has become a mainstream channel of communication where users share and exchange information. Social media are powerful tools for developing evidence, practice, and policy to provide a cost-effective way to increase user interaction, peer-to-peer support, and widen access to health interventions and hard-to-reach populations. Utilizing social media data for research is a relatively new idea. This session will address research challenges and opportunities of using social media data for health research.

Moderator Amir Karami (UofSC)

Presentation 1   *Using Media Data for Monitoring and Prediction of Public Health Outcomes*

 Wei Wang (UCLA)

Presentation 2   *Challenges in Digital Epidemiology: Using Social Media Mining for Health Research*

 Graciela Gonzalez-Hernandez (UPenn)

Friday, February 5, 2021

Breakout Sessions (Set 1) | 1:00pm – 3:00pm (EST)
Genomic Session
Virtual Room: Charleston

Data Empowered Genomic Analysis

Session Summary: The completion of the human genome project in 2003 marked the beginning of the Era of modern Bioinformatics and Genomics analyses. The quantity of acquired genomic data has increased precipitously in the last two decades due to the advances in sequencing technologies. The rapid sequencing of SARS-CoV-2 and its relationship to SARS-CoV is a testimony to our technological advancement in the arena of Genomic analysis. Although genomic data can now be acquired rapidly and at a substantially reduced cost, the computational analysis of the genomic data continues to challenge the international community of investigators and researchers. In this session, a number of presentations will highlight the advanced utility and analysis of genomic and proteomic data in numerous investigations across the state of South Carolina.

Moderator Homayoun Valafar (UofSC)

Presentation 1	***Proximity-dependent Biotinylation to Study Host Shutoff Nonstructural Protein 1 of SARS Coronavirus***

 Anita Nag (UofSC Upstate)

Presentation 2	***Presentation by Dr. Ana Pocivavsek***

 Ana Pocivavsek (UofSC)

Presentation 3	***Transcriptomic Studies in Outbred Deer Mice***

 Hippokratis Kiaris (UofSC)

Presentation 4	***Applying msTALI to Active Site Identification Studies on SARS-Co-V-2***

 Devaun McFarland (UofSC)

Presentation 5	***Predicting Individual Outcomes of Heart Failure with Preserved Ejection Fraction Patients to Cardiac Re-Synchronization Therapy Using Artificial Intelligence***

 Brendan Odigwe (UofSC)

Friday, February 5, 2021

Breakout Sessions (Set 2) | 3:00pm – 5:00pm (EST)
Electronic Health Records Session II
Virtual Room: Richland

Challenges of Complex Analysis in EHR Data

Session Summary: Today, 21st century technology provides access to massive but useful health related data such as sentinel reporting systems, statewide syndromic surveillance data, disease registries, genomic databases, twitter, outbreak investigation reports, and spatial and human dynamics data. This access to data poses a challenge: how do we handle these data sets? This session focused on the new advancement in Big Data Analytics including Network-based Statistical Analysis and AI-infused Telehealth to handle the health-related big data such as biomedical data generated from medical image and Wearable activity trackers.

Moderator Peiyin Hung (UofSC)

Presentation 1 — *Network-based Statistical Analysis of Functional Magnetic Resonance Imaging Data in Post-stroke Aphasia*

 Xingpei Zhao (UofSC)

Presentation 2 — *Challenges in AI-infused Telehealth in the Post-Covid19 Era*

 Ugur Kursuncu with Manas Gaur, Kaushik Roy, and Amit Sheth (UofSC)

Presentation 3 — *Using Behavior of Wearable Activity Trackers and Its Relation with HbA1c Among Type 2 Diabetes Patients (T2DM)*

 Xinying Sun (Peking University, China)

Presentation 4 — *Emergence and Evolution of Big Data Analytics in HIV Research: Bibliometric Analysis of Federally Sponsored Studies in HIV 2000-2019*

 Chen Liang (UofSC)

Friday, February 5, 2021
Breakout Sessions (Set 2) | 3:00pm – 5:00pm (EST)

SC RFA Workshop
Virtual Room: Charleston

Accessing Data Housed
at SC Revenue and Fiscal Affair Office

Session Summary: The SC Revenue and Fiscal Affairs Office houses integrated longitudinal data on behalf of stakeholders from across the state. This workshop will describe these extensive holdings, the various resources that RFA can provide in support of studies and analyses, and the process through which these data can be accessed..

Moderator   Bankole Olatosi (UofSC)

Presenters   David Patterson (SC RFA)

Dianne Davis (SC RFA)

Elizabeth Hall (SC RFA)

VHA Data Access Workshop
Virtual Room: Greenville

Epidemiologic Research Using Big Data

Session Summary: This presentation should give an overview of the steps to getting access to VHA data for research purposes. Disclaimer – One must understand that proper credentialing with the VA is required, and maintenance of VA regulatory requirements is a must prior to even beginning the steps. Attending this seminar should in no way suggest that you are eligible to access VA data – that is determined on an individual basis by VA administration.

Moderator   Homayoun Valafar (UofSC)

Presentation 1   Roy Mathew (Columbia VA HCS)

Presentation 2   Hugh Welch (Columbia VA HCS)

Friday, February 5, 2021

Breakout Sessions (Set 2) | 3:00pm – 5:00pm (EST)

BDHSC 2020 Pilot Project Showcase
Virtual Room: Lexington

Moderator Jan Eberth (UofSC)

Panel 1
3:00pm – 4:00pm

Topological Network Analysis and Graph-Based Deep Learning of Multimodal MRI: An ENIGMA-Epilepsy Study

Yuan Wang (UofSC)

Big Genomic Data Analysis to characterize TME-methylation-expression Regulatory Axis in Colorectal Tumors

Guoshuai Cai (UofSC)

Utilization of Artificial Intelligence assisted data analytics to better predict progression of chronic kidney disease to end stage than currently available predictive markers

Homayoun Valafar (UofSC)

Panel 2
4:00pm – 5:00pm

Evaluating a Technology EMR-Based Strategy to Intervene on Social Determinants of Health-Related Needs in a Large Health System

Caroline Rudisill (UofSC)

Electronic Health Records to Estimate Effects of Dental Treatment on Systemic Health

Anwar Merchant (UofSC)

Using Natural Language Processing to Generate Treatment Decision Themes from Clinical Encounter Notes for Patients with Shoulder Conditions

Benjamin Schooley (UofSC)

Saturday, February 6, 2021

Plenary Presentations | 9:00am – 12:00pm (EST)

Virtual Room: Richland

9:00am – 10:15am

Statistical and Machine Learning Methods for Optimal Treatment Regime Estimation and Inference

Summary: Precision medicine is an emerging medical paradigm that focuses on developing the optimal treatment regime tailored for individual patients. In this paradigm, treatment duration, dose and type are tailored over time and tailored according to an individual's information, aiming to optimize the effectiveness of treatment. Several challenges emerge in deriving optimal treatment regime with the fast grow of data. In this talk, I will present some recent development in statistical and machine learning for optimal treatment regime (OTR) estimation and inference. In particular, I will discuss OTR estimation with high-dimensional predictors and consider sequential decision making problems in infinite horizon settings where the number of decision points diverges to infinity and propose a Sequential Value Evaluation (SAVE) method to recursively update the estimated optimal policy and its value estimator. Both empirical and theoretical properties of the proposed methods will be discussed.

Wenbin Lu (North Carolina State University)

10:15am – 11:00am

Integrating Big Data into Theory and Applications on Health-Behavioral Change

Dolores Albarracin (University of Illinois at Urbana-Champaign)

11:00am – 11:15am   **Tea Break**

11:15am – 12:00pm

Operational Analytics in Veteran Healthcare

Summary: An overview of the challenges faced when transforming healthcare data into actionable insights and some strategies for success. This presentation will highlight the role of the Columbia VA Healthcare System Data Center in addressing the many and varied requests for information from executive leadership to front-line staff. It will touch on the employee model required for supporting the day-to-day operations of the Healthcare System as well as the implementation of advanced analytics for discovering insights obscured in the data and converting them into tangible improvements in patient care.

Hugh Welch (Columbia VA HCS)

Poster Presentation Q&A | 12:00pm – 1:00pm (EST)

Virtual Room: Exhibition Hall

Saturday, February 6, 2021

Plenary Presentations | 1:00pm – 4:00pm (EST)

Virtual Room: Richland

1:00pm – 1:45pm

Saving Lives and Livelihoods: Data and Analytics in the Fight Against COVID-19.

Summary: As we all know, COVID-19 has presented challenges to government, life science, and health care, that we haven't seen for over 100 years. However, at the same time, we have access to more data than at any point in human history. This presentation will talk about how data and analytics were pressed into service to help government and health care make better, faster decisions to both save lives and help support better decisions to protect economies. We'll look at a number of stories from around the world that demonstrate the practical impact of putting data to work in the fight against the pandemic.

Steve Bennett (SAS)

1:45pm – 2:30pm

Reading Between the Tweets: Using Social Data for Predicting and Changing Public Health Behaviors

Summary: Social technologies, such as social media, wearable devices, and online search data, are increasingly being studied for use as data sources to inform public health. These technologies and their data, have the potential to be used to both monitor public health issues and change people's health-related behaviors. Using HIV, mental health, substance use, car crashes, and COVID-19 as case studies, this presentation will describe methods of using social technology data to monitor and predict health-related outcomes, as well as presenting ways that these technologies can be used to change people's health behaviors. We will discuss the implications and needs for implementation science related to these approaches.

Sean Young (University of California)

2:30pm – 2:45pm

Tea Break

2:45pm – 3:30pm

Elaboration of Disease Pathways to Drive Future Requirements for Healthcare Systems Using Innovation Think Tank

Sultan Haider (Siemens Healthineers)

3:30pm – 4:00pm

Closing Remarks

Stephen J. Cutler, Dean of College of Pharmacy, UofSC