MSSISS 2023

MARCH 9–10
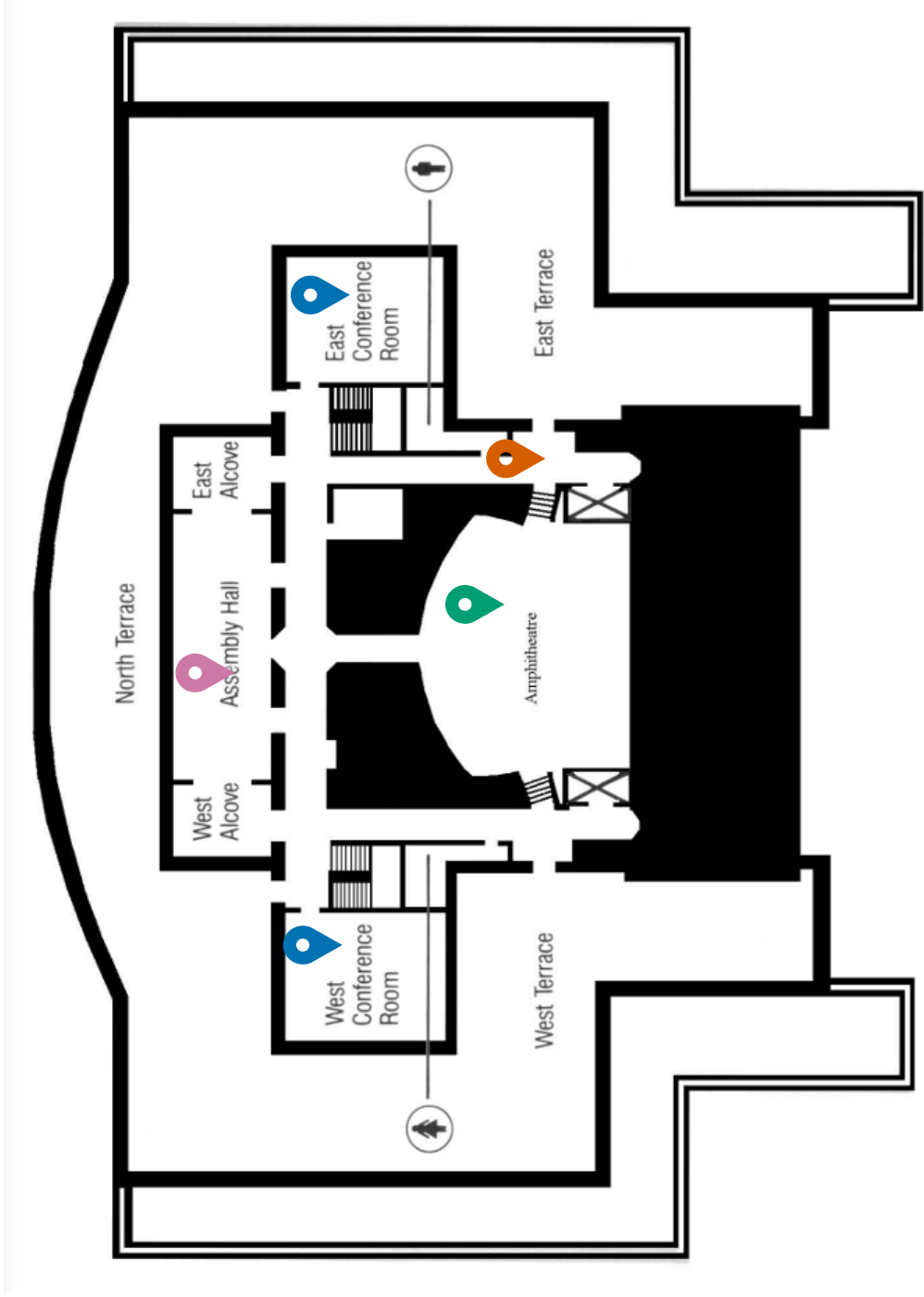
Michigan Student Symposium for Interdisciplinary Statistical Sciences

MSSISS 2023

4th Floor

Registration

Poster Session

Oral/Speed Presentations

Lunch

North Terrace

West Alcove

Assembly Hall

East Alcove

West Conference Room

East Conference Room

West Terrace

East Terrace

Amphitheatre

MARCH 9TH

9:00am–9:30am
Assembly Hall
Check-in and Breakfast

9:30am–12:00pm
Amphitheatre
Opening Remarks & 15-min Oral Presentation I

12:00pm-1:00pm
Assembly hall
Lunch

1:00pm–2:00pm
Amphitheatre
Keynote Speech By Dr. Kosuke Imai

2:00pm–3:45pm
Amphitheatre
5-min Speed Oral Presentation

3:45pm–5:30pm
East/West Conference Room
Poster Session

MARCH 10TH

9:00am–9:30am
Assembly Hall
Breakfast

9:30am–12:00pm
Amphitheatre
15-min Oral Presentation II

12:00pm–1:00pm
Assembly Hall
Lunch

1:00pm–3:30pm
Amphitheatre
15-min Oral Presentation III

3:30pm–4:30pm
Amphitheatre
Research Talk by Dr. Walter Dempsey

4:30pm–5:00pm
Amphitheatre
Awards Ceremony

ABOUT

The Michigan Student Symposium for Interdisciplinary Statistical Sciences (MSSISS) is an annual event organized by graduate students in the Biostatistics, Electrical Engineering & Computer Science (EECS), Industrial & Operations Engineering (IOE), Statistics and Survey and Data Science (MPSDS) departments at the University of Michigan. The goal of this symposium is to create an environment for communication across related fields of statistical sciences and promotes interdisciplinary research among students and faculty. It encourages students to present their work, share insights, and exposes them to diverse applications of statistical sciences. Though hosted by five departments, we extend our invitation to students from all departments across the university to present their statistical research in the form of an oral presentation or a poster.

MSSISS 2023 is the 17th version of this event. The symposium will take place at the Rackham Graduate School Building on March 9th and March 10th. There will be five sessions dedicated to student research project presentations. Among them are three 15-min oral presentations, one 5-min speed oral presentation and one poster session. There are 57 student research projects. Besides student research showcase, the symposium has also invited two faculty members to deliver the keynote speech and a research talk. The keynote speech is delivered by a senior faculty member from outside the University of Michigan who has profound contributions to interdisciplinary statistical research. The research talk is delivered by a junior faculty member from the University of Michigan and exposes students to cutting-edge statistical research topics.

We appreciate your interest in MSSISS and look forward to your active participation. Go blue!

KEYNOTE SPEAKER

Kosuke Imai

Professor of Political Science and Statistics,
Harvard University

🕐 **March 9th, 1:00pm-2:00pm**

📍 **Amphitheatre**

Experimental Evaluation of Algorithm-Assisted Human Decision-Making: Application to Pretrial Public Safety Assessment

Abstract: Despite an increasing reliance on fully-automated algorithmic decision-making in our day-to-day lives, human beings still make highly consequential decisions. As frequently seen in business, healthcare, and public policy, recommendations produced by algorithms are provided to human decision-makers to guide their decisions. While there exists a fast-growing literature evaluating the bias and fairness of such algorithmic recommendations, an overlooked question is whether they help humans make better decisions. We develop a general statistical methodology for experimentally evaluating the causal impacts of algorithmic recommendations on human decisions. We also show how to examine whether algorithmic recommendations improve the fairness of human decisions and derive the optimal decision rules under various settings. We apply the proposed methodology to preliminary data from the first-ever randomized controlled trial that evaluates the pretrial Public Safety Assessment (PSA) in the criminal justice system. A goal of the PSA is to help judges decide which arrested individuals should be released. On the basis of the preliminary data available, we find that providing the PSA to the judge has little overall impact on the judge's decisions and subsequent arrestee behavior. Our analysis, however, yields some potentially suggestive evidence that the PSA may help avoid unnecessarily harsh decisions for female arrestees regardless of their risk levels while it encourages the judge to make stricter decisions for male arrestees who are deemed to be risky. In terms of fairness, the PSA appears to increase an existing gender difference while having little effect on any racial differences in judges' decisions. Finally, we find that the PSA's recommendations might be unnecessarily severe unless the cost of a new crime is sufficiently high.

Walter Dempsey

Assistant Professor of Biostatistics
Assistant Research Professor, Institute for Social Research
University of Michigan

🕐 March 10th, 3:30pm-4:30pm

📍 Amphitheatre

Using data to inform just-in-time adaptive interventions in mobile health: promise, pitfalls, and perspective

Abstract: Twin revolutions in wearable technologies and smartphone-delivered digital health interventions have significantly expanded the accessibility and uptake of mobile health (mHealth) interventions in multiple domains of health sciences. Sequentially randomized experiments called micro-randomized trials (MRTs) have grown in popularity as a means to empirically evaluate the effectiveness of mHealth intervention components. Data collected in MRTs allow health scientists to answer important scientific questions about how intervention effectiveness may change over time or be moderated by individual characteristics, time-varying context, or past responses. In this talk we discuss our work on a variety of mobile health interventions. Specifically, we will highlight the promise and pitfalls of data-driven optimization of just-in-time adaptive interventions.

15-MIN ORAL PRESENTATION I

🕐 **March 9th, 9:30am – 12:00pm**   📍 **Amphitheatre**

Submit feedbacks through http://bit.ly/3XooR1d

Wenshan Yu

PhD Student
Survey and Data Science

Are interviewer variances equal across modes in mixed-mode studies?

Hu Sun

PhD Student
Statistics

Tensor Gaussian Process with Contraction for Tensor Regression

---

Yilun Zhu

PhD Student
EECS

Mixture Proportion Estimation Beyond Irreducibility

Jing Ouyang

PhD Student
Statistics

Statistical Inference for Noisy Incomplete Binary Matrix

Zongyu Li

PhD Student
EECS

Poisson Phase Retrieval in Very Low-count Regimes

Shihao Wu

PhD Student
Statistics

Constrained Approaches in Learning High-dimensional Sparse Structures: Statistical Optimality and Optimization Techniques

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Shushu Zhang

PhD Student
Statistics

Estimation and Inference for High-dimensional Expected Shortfall Regression

5-MIN SPEED PRESENTATION

🕐 March 9th, 2:00pm – 3:45pm   📍 Amphitheatre

Submit feedbacks through http://bit.ly/3XooR1d

Jiazhi Yang

Master's Student
Survey and Data Science

Weighting Adjustments for Person-Day Nonresponse: An Application to the National Household Food Acquisition and Purchase Survey

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Rupam Bhattacharyya

PhD Student
Biostatistics

BaySyn: Bayesian Evidence Synthesis for Multi-system Multiomic Integration

---

Kevin Smith

PhD Student
Industrial and Operations Engineering

Leveraging Observational Data to Estimate Adherence-Improving Treatment Effects for Stone Formers

---

Zeyu Sun

PhD Student
EECS

Event Rate Based Recalibration of Solar Flare Prediction

Sehong Oh

Master's Student
EECS

Anomaly detection via Pattern dictionary and Atypicality

Kiran Kumar

PhD Student
Biostatistics

Meta Imputing Low Coverage Ancient Genomes

Mengqi Lin

PhD Student
Statistics

Identifiability of Cognitive Diagnostic Models with polytomous responses

Yumeng Wang PhD Student Statistics	**ReBoot: Distributed statistical learning via refitting Bootstrap samples**
Yifan Hu Master's Student Statistics	**Establishing An Optimal Individualized Treatment Rule for Pediatric Anxiety with Longitudinal Modeling for Evaluation**
Xinyu Liang Master's Student Statistics	**Social Network Analysis of securities analysts' academic network and its impact on analysts' performance taking bank industry star analysts as an example**
Robert Malinas PhD Student EECS	**An Improvement on the Hotelling T^2 Test Using the Ledoit-Wolf Nonlinear Shrinkage Estimator**
Huda Bashir Master's Student Epidemiology & Public Policy	**Racial residential segregation and adolescent birth rates in Brazil: a cross-sectional study in 152 cities, 2014-2016**
Stephanie Morales PhD Student Survey and Data Science	**Assessing Cross-Cultural Comparability of Self-Rated Health and Its Conceptualization through Web Probing**
Declan McNamara PhD Student Statistics	**Likelihood-Free Inference for Deblending Galaxy Spectra**

POSTER PRESENTATION

🕐 **March 9th, 3:45pm – 5:30pm**   📍 **East/west Conference Room**

Submit feedbacks through http://bit.ly/3XooR1d

1

Wenchu Pan

Master's Student
Biostatistics

Small Sample Adjustments of Variance Estimators in Clustered Dynamic Treatment Regimen

2

Cody Cousineau

PhD Student
Nutritional Sciences

Cross-sectional association between blood cholesterol and calcium levels in genetically diverse strains of mice

3

Xinyu Zhang

PhD Student
Survey and Data Science

Dynamic Time-to-Event Models for Future Call Attempts Required Until Interview or Refusal

4

Savannah Sturla

PhD Student
Environmental Health Sciences

Urinary paraben and phenol concentrations associated with inflammation markers among pregnant women in Puerto Rico

5

Youqi Yang

Master's Student
Biostatistics

What can we learn from observational data wrinkled with selection bias? A case study using COVID-19 Trends and Impact Survey on COVID-19 vaccine uptake and hesitancy in India and the US during 2021

6

Karen (Kitty) Oppliger

Master's Student
Nutritional Sciences

Differential disability risk among gender and ethnic groups by substitution of animal- with plant-protein

7

Irena Chen

PhD Student
Statistics

Individual variances as a predictor of health outcomes: investigating the associations between hormone variabilities and bone trajectories in the midlife

8

Qikai Hu

Master's Student
Statistics

Simulation Study for Predicting Solar Flares with Machine Learning

9

Mallika Ajmani

Master's Student
Epidemiology

Kidney Function is Associated with Cognitive Status in United States Health and Retirement Study

10

James Edwards

Undergraduate Student
Data Science

Financial and Information Aggregation Properties of Gaussian Prediction Markets

11

Qinmengge Li

PhD Student
Biostatistics

Bregman Divergence-Based Data Integration with Application to Polygenic Risk Score (PRS) Heterogeneity Adjustment

12

Neophytos Charalambides

PhD Student
EECS

Approximate Matrix Multiplication and Laplacian Sparsifiers

13

Rui Nie

Undergraduate Student
Statistics

Exploring Machine Olfaction

14

Simon Nguyen

Master's Student
Statistics

Optimal full matching under a new constraint on the sharing of controls Application in pediatric critical care

15

Jialu Zhou

Master's Student
Biostatistics

Application of Statistical Methodology in the High-Frequency Data Volatility Research

16

Ziping Xu

PhD Student
Statistics

Adaptive Sampling for Discovery

17

Bach Viet Do

PhD Student
Statistics

Modeling Solar Flares' Heterogeneity With Mixture Models

18

Longrong Pan

Master's Student
Survey and Data Science

Global Health Interactive Visualization

19

Felipe Maia Polo

PhD Student
Statistics

Conditional independence testing under model misspecification

20

Alexander Kagan

PhD Student
Statistics

Influence Maximization under Generalized Linear Threshold Models

15-MIN ORAL PRESENTATION II

March 10th, 9:30am – 12:00pm Amphitheatre

Submit feedbacks through http://bit.ly/3XooR1d

Jeong Hin Chin Undergraduate Student Statistics	**Using Statistical Methods to Predict Team Outcomes**
Margaret Banker PhD Student Biostatistics	**Regularized Simultaneous Estimation of Changepoint and Functional Parameter in Functional Accelerometer Data Analysis**
Easton Huch PhD Student Statistics	**Bayesian Randomization Inference: A Distribution-free Approach to Bayesian Causal Inference**
Daniele Bracale PhD Student Statistics	**Semi-Parametric Non-Smoothing Optimal Dynamic Pricing**
Jeffrey Okamoto PhD Student Biostatistics	**Probabilistic integration of transcriptome-wide association studies and colocalization analysis identifies key molecular pathways of complex traits**
Charlotte Mann PhD Student Statistics	**Combining observational and experimental data for causal inference considering data privacy**
Jieru Shi PhD Student Biostatistics	**Debiased machine learning of causal excursion effects to assess time-varying moderation**
Lap Sum Chan PhD Student Biostatistics	**Identification and Inference for High-dimensional Pleiotropic Variants in GWAS**

15-MIN ORAL PRESENTATION III

🕐 **March 10th, 1:00pm - 3:30pm**   📍 **Amphitheatre**

Submit feedbacks through http://bit.ly/3XooR1d

Di Wang

PhD Student
Biostatistics

Incorporating External Risk Information from Published Prediction Models with the Cox Model Accounting for Population Heterogeneity

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Mason Ferlic

PhD Student
Statistics

Optimizing Event-triggered Adaptive Interventions in Mobile Health with Sequentially Randomized Trials

---

Saghar Adler

PhD Student
EECS

Learning a Discrete Set of Optimal Allocation Rules in a Queueing System with Unknown Service Rate

---

Madeline Abbott

PhD Student
Biostatistics

A latent variable approach to jointly modeling emotions and cigarette use in a mobile health study of smoking cessation

---

Jaeshin Park

PhD Student
Industrial and Operations
Engineering

Stratified sampling for reliability analysis using stochastic simulation with multi-dimensional input

---

Mengqi Lin

PhD Student
Statistics

Controlling the false discovery rate under dependency with the adaptively weighted BH procedure

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Hanna Venera

Master's Student
Biostatistics

Data Analytic Approach for Hybrid SMART-MRT Designs: The SMART Weight Loss Case Study

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Shota Takeishi

Visiting PhD Student
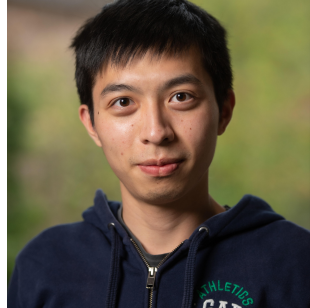Statistics

A Shrinkage Likelihood Ratio Test for High-dimensional Subgroup Analysis with a Logistic-Normal Mixture Model

ORGANIZING COMMITTEE
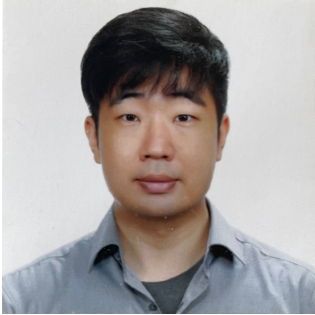
Ki Hong

PhD Student

Statistics

Naichen Shi

PhD Student

Industrial and Operations
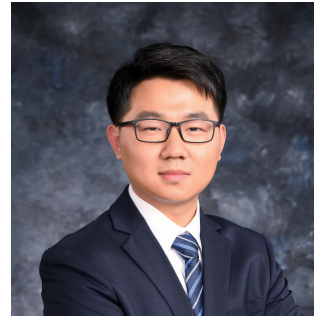
Engineering

Deji Suolang

PhD Student

Survey and Data Science

Mukai Wang

PhD Student

Biostatistics

Yilun Zhu

PhD Student

Electrical Engineering and

Computer Science

The organizing committee would like to thank multiple faculty, students and staff for the success of MSSISS 2023.

Administrative Staff: Amanda Larson (Biostatistics), Holly McCamant (Biostatistics), Dave Kubacki (Biostatistics), Wendy Mashburn (Biostatistics), Judy McDonald (Statistics), Kristy Robinson (Statistics), Josh Caldwell (Rackham), Jill Esau (Survey Research Center), Nancy Oeffner (Survey Research Center), Catherine Thibault (Survey Research Center), Catharine June (Electrical and Computer Engineering)

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CONTACT
https://sites.lsa.umich.edu/mssiss/
mssiss2023-contact@umich.edu