



The Western North American  
Region of The International Biometric Society

# 2022 Annual Meeting

W<sup>N</sup>AR / I<sup>M</sup>S / J<sup>R</sup>

June 10 – 15, 2022

## Program & Schedule

Virtual Conference

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Conference Schedule  
WNAR/IMS 2022

Friday, June 10, 2022

9:00 - 10:15 PDT	Short Course 1
10:15 - 10:45 PDT	Break
10:45 - 12:00 PDT	Short Course 1

Saturday, June 11, 2022

8:30 - 10:00 PDT	Short Course 2
10:00 - 10:20 PDT	Break
10:20 - 11:50 PDT	Short Course 2
11:50 - 1:00 PDT	Break
1:00 - 2:30 PDT	Short Course 2
2:30 - 2:50 PDT	Break
2:50 - 4:20 PDT	Short Course 2

## Monday, June 13, 2022

8:30 - 10:15 PDT	WNAR 1	WNAR 2	WNAR 3	C 1	SP 1
10:15 - 10:30 PDT	Break				
10:30 - 12:15 PDT	WNAR 4	WNAR 5 (JEDI)	WNAR 6	C 2	SP 2
12:15 - 1:45 PDT	Break				JEDI Social Hour
1:45 - 3:30 PDT	WNAR 7	WNAR 8	WNAR 9	C 3	SP 3
3:30 - 3:45 PDT	Break				
3:45 - 5:30 PDT	WNAR 10	WNAR 11	WNAR 12	C 4	SP 4

- WNAR = WNAR Invited Session
- IMS = Institute of Mathematical Statistics Invited Session
- C = Contributed Session
- SP = Student Paper Session
- JEDI = Justice, Equity, Diversity, and Inclusion

## Tuesday, June 14, 2022

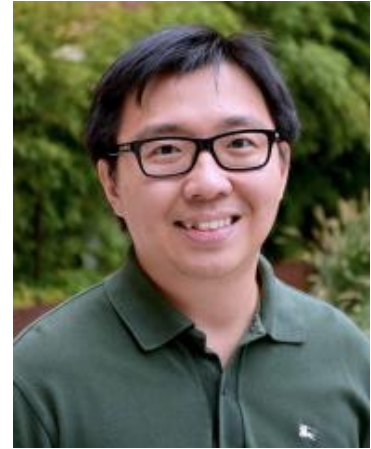
8:30 - 10:15 PDT	WNAR 13	WNAR 14	WNAR 15	C 5	SP 5
10:15 - 10:30 PDT	Break				
10:30 - 12:15 PDT	WNAR 16	WNAR 17	WNAR 18	WNAR 19	SP 6
12:15 - 1:45 PDT	Break				Student Social Hour
1:45 - 3:30 PDT	WNAR 20	WNAR 21	WNAR 22	IMS 1	SP 7
3:30 - 3:45 PDT	Break				
3:45 - 5:30 PDT	Presidential Invited Address				

## Wednesday, June 15, 2022

8:30 - 10:15 PDT	WNAR 23	WNAR 24	WNAR 25	SP 8
10:15 - 10:30 PDT	Break			
10:30 - 12:15 PDT	WNAR 26	WNAR 27		SP 9

## President's Welcome - June 2022

Welcome to the 2022 WNAR/IMS/JR virtual Conference! We have a diverse and full program including 2 short courses: “Veridical data analysis” by Bin Yu and Rebecca Barter on June 10 and “Clinical Development of New Drugs” by Naitee Ting on June 11, a special justice, equity, diversity and inclusion (JEDI) social hour at lunch time on June 13, a presidential invited lecture by Nicholas Jewell titled “Biostatistics in Infectious Disease Research: Test-negative designs from Influenza, Dengue and Ebola to COVID-19” on June 14, and 42 scientific sessions (28 invited, 5 contributed and 9 student paper competition) from June 13 to June 15.



The pandemic has challenged our conference organization in multiple ways. When we polled our members for their preference for an in-person or a virtual meeting even before the omicron wave started, it was unclear what the COVID trend will be in six months, if travel restrictions for our Canadian members would still be prohibitive, and how much restrictions will still be in place by our original host university, UC Davis. I would like to thank Kyoungmi Kim, our original local organizer, for initial exploration and flexibility. We decided to switch to virtual before the invited proposal submission deadline, to eliminate uncertainties to the organizers and speakers. There are certainly pros and cons of a virtual conference. While we missed our in-person interactions and some colleagues from the Japan Region who joined our past in-person meetings, we have an increased attendance from colleagues in the east coast and overall student attendance.

The conference is not possible without the voluntary commitment of many colleagues behind the scenes. The WNAR Program Chair Damla Senturk has organized a fabulous program involving invited talks, contributed talks and student competition sessions from diverse areas in over 40 sessions. I would also want to thank our co-organizers, Institute of Mathematical Statistics (IMS) and Japan Region (JR) of IBS for continued partnership: Jelena Bradic organized an IMS invited session and JR president Shigeyuki Matsui solicited an invited session from JR members, despite the time difference that limits participation of our Japanese colleagues. Our student competition chair, Fan Yang coordinated the judging process with 11 reviewers for over 40 student papers. Subodh Selukar led a team of 4 that coordinates with the online platform, session chairs and speakers to ensure smooth delivery of the virtual conference. Our JEDI committee chair, Nairanjana (Jan) Dasgupta, organized the JEDI social hour, our secretary Jessica Minnier and treasurer Brandie Wagner helped making a smooth registration process, the past-president Laura Cowen, president-elect Elizabeth Juarez-Colunga and other Regional Committee for various decisions along the planning phase.

Finally, I would like to thank everyone for joining and I hope that all of us will have an enjoyable and engaging conference experience.

KC Gary Chan  
2022 WNAR president

## Social Media

Follow WNAR on Twitter [@WNAR\\_ibs](#) and get conference news using [#WNAR2022](#).

## WNAR Code of Conduct Policy

### ***All participants are required to follow the WNAR code of conduct policy***

As a professional organization composed of diverse individuals, WNAR is committed to fostering a culture of inclusion, professionalism and civil discourse that cultivates a respectful environment where ideas are exchanged openly and freely. WNAR is committed to creating a professional environment for participants at all stages of their careers, and especially for our more junior members.

Inappropriate, unprofessional, harassing, or threatening behavior is not tolerated at the WNAR annual meeting or any other WNAR event. This includes threatening physical or verbal interactions, deliberate intimidation, stalking, sexual images in public spaces, unauthorized or inappropriate photography or recording, inappropriate or unwanted physical contact, unwelcome sexual attention, or verbal harassment. Verbal harassment includes harassing comments relating to race, ethnicity, religion, gender, gender identity or expression, sexual orientation, disability, veteran status, or other protected statuses, and will not be tolerated in our community.

All meeting participants must comply fully with the WNAR Code of Conduct. Participants include, but are not limited to, conference attendees, guests, staff, contractors, vendors, and exhibitors. The Code applies to social events as well as all scientific sessions, workshops, tutorials, roundtables, and short courses.

If you have any knowledge of a violation to the WNAR Code of Conduct, please contact a member of the event staff immediately and/or email [wnar@wnar.org](mailto:wnar@wnar.org). If there are any concerns regarding the Code of Conduct, please contact [wnar@wnar.org](mailto:wnar@wnar.org).

## WNAR Officers

of the Western North American Region of the International Biometric Society

### **Elected Officers and Representatives (Regional Committee)**

Office	Year(s)	Officer	Affiliation
President	2022	Gary Chan	University of Washington
Secretary/Correspondent	2022-25	Jessica Minnier	Oregon Health & Science University
Treasurer	2020-23	Brandie Wagner	University of Colorado Anschutz Medical Campus
Program Coordinator	2022-23	Lingling An	University of Arizona
President Elect	2022	Elizabeth Juarez-Colunga	University of Colorado Anschutz Medical Campus
Past President	2022	Laura Cowen	University of Victoria

#### Representatives At-Large

2022-24	Ting Ye	University of Washington
2022-24	Yiliang Zhu	University of New Mexico
2020-22	Lisa Brown	Seattle Genetics
2020-22	Karen Messer	University of California, San Diego
2021-23	Charlotte Gard	New Mexico State University
2021-23	Julia Palacios	Stanford University

#### IBS Council Representatives

2021-25	Megan Othus	Fred Hutchinson Cancer Research Center
2021-25	Lang Wu	University of British Columbia
2019-23	Elizabeth Juarez-Colunga	University of Colorado Anschutz Medical Campus

### **Appointments**

#### RAB – Regional Advisory Board

Years	Members	Affiliation
2021-22	Jennifer McNichol	University of Victoria (Student representative)
2022-24	Neby Bekele	Exelixis
	Chiung-Yu Huang	University of California, San Francisco
	Jennifer Nelson	Kaiser Permanente Washington Health Research Institute
2021-23	Ruth Joy	University of British Columbia
	Linglong Kong	University of Alberta
	Leslie New	Washington State University
2020-22	Fang Chen	SAS
	Joan Hu	Simon Fraser University
	David Rocke	University of California, Davis



2022 WNAR Program Committee

Damla Senturk (Chair) University of California, Los Angeles  
Emilie Campos O'Banion University of California, Los Angeles

2022 IMS Program Chair

Jelena Bradic University of California, San Diego

2022 WNAR Student Paper Competition Committee

Fan Yang (Chair) University of Colorado Anschutz Medical Campus  
Jarrett Barber Northern Arizona University  
Fei Gao Fred Hutchinson Cancer Research Center  
Joshua Keller Colorado State University  
Lihua Lei Stanford University  
John Rice University of Colorado Anschutz Medical Campus  
Subodh Selukar St. Jude's Children's Research Hospital  
Kirthika Suresh University of Colorado Anschutz Medical Campus  
Katherine Wilson University of Washington  
Fan Xia University of Washington  
Fuyong Xing University of Colorado Anschutz Medical Campus  
Ting Ye University of Washington  
Ying Zhou Fred Hutchinson Cancer Research Center

2022 WNAR Organization Committee

Subodh Selukar (Chair) St. Jude's Children's Research Hospital  
Adam Elder University of Washington  
Kendrick Li University of Michigan  
Eric Morenz University of Washington

## Presidential Invited Address

Nicholas Jewell, PhD

UC Berkeley and London School of Hygiene and Tropical Medicine

### Biostatistics in Infectious Disease Research: Test-negative designs from Influenza, Dengue and Ebola to COVID-19

#### Abstract

Statisticians are sorely needed in infectious disease research as the past few years have starkly illustrated. Test-negative designs are a relatively recent addition to observational study tool boxes, originally employed for assessment of seasonal influenza vaccination programs. I will review the rationale and development of the original test-negative design and discuss extensions to cover randomized exposures, various kinds of clustering and mixed testing programs, with illustrations from both dengue fever and ebola virus diseases. Recent interest has focused on uses of the test-negative design to estimate and compare effectiveness of COVID-19 vaccines. The presentation will highlight statistical issues associated with the design and analysis of resulting data, and opportunities for further research.

## Short Course 1

### Veridical Data Analysis

Instructor: **Bin Yu**, PhD

Instructor: **Rebecca Barter**, PhD

#### Course Description:

Predictability, computability, and stability (PCS) are three core principles of data science. They embed the scientific principles of prediction and replication in data-driven decision making while recognizing the central role of computation. Based on these principles, we propose the PCS framework, including workflow and documentation (in R Markdown or Jupyter Notebook). The PCS framework aims at responsible, reliable, reproducible, and transparent analysis across fields of science, social science, engineering, business, and government. It can be used as a recommendation system for scientific hypothesis generation and experimental design. In particular, we propose (basic) PCS inference for reliability measures on data results, extending statistical inference to a much broader scope as current data science practice entails.

## Short Course 2

### Clinical Development of New Drugs

Instructor: **Naitee Ting**, PhD

#### Course Description:

Modern drug development started with the 1962 Kefauver-Harris FD&C Amendment. After 1962, Pharmaceutical industries develop new drugs with clinical evidence of efficacy and safety. The clinical development of a new drug is divided into four phases – Phases I, II, III, and IV. The first three phases

are considered as the pre-marketing phases and Phase IV is post marketing. The focus of this short course will be pre-marketing drug development, with an emphasis on Phase II. In 2019, ICH finalized its E9 R1 document. The ICH E9 R1 introduces a new concept of estimand. This short course will also help clarify the thinking behind estimand.

## Scientific Program

### WNAR Invited 1

Monday, June 13, 2022

8:30 - 10:15 am PDT

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#### **Semi- and non- parametric statistical methods for omics data**

Organizer & Chair: Xinlian Zhang, University of California, San Diego

8:30 **Distance-based Semiparametric Regression Framework for Between-subject attributes: Applications to High-dimensional Sequences of Microbiome and Wearables**

Jinyuan Liu, University of California, San Diego

8:55 **Statistical model for recovering the low rank structure of spatial transcriptomics data**

Sha Cao, Indiana University

9:20 **B-scaling: a novel nonparametric data fusion method**

Yiwen Liu, University of Arizona

9:45 **Floor Discussion**

### WNAR Invited 2

Monday, June 13, 2022

8:30 - 10:15 am PDT

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#### **Ecological Statistics Early Career Researcher Showcase**

Organizer & Chair: Laura Cowen, University of Victoria

8:30 **Simultaneous estimation of diet composition and covariate modelling: an extension to MUFASA**

Holly Steeves, University of Western Ontario

8:55 **Bayesian state-space models with applications to aquatic acoustic telemetry data**

Inesh Prabuddha Munaweera Arachchilage, University of Manitoba

9:20 **N-mixture models for large populations**

Matthew Parker, Simon Fraser University

9:45 **Spatial Capture-Recapture Without Animal Identity**

Paul van Dam-Bates, University of St Andrews

### WNAR Invited 3

Monday, June 13, 2022

8:30 - 10:15 am PDT

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#### **Recent Advances in Categorical Data Analytics**

Organizer & Chair: Krishna Saha, Central CT State University

8:30 **High-dimensional fixed effects profiling models: New developments and applications**

Danh Nguyen, University of California Irvine

8:55 **Likelihood-based Approach for Testing the Homogeneity of Risk Difference or Risk Ratio in a Multicenter Randomized Clinical Trial**

Krishna Saha, Central CT State University

9:20 **New Development in Regression Model for Aggregate Ordinal Outcomes with Missing Categories**

Yeongjin Gwon, University of Nebraska Medical Center

9:45 **Joint Analysis of Binary and Continuous Data via Joint Modelling of Jittered Binary and Continuous Outcomes: A New Approach**

Mili Roy, University of Calgary

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**Contributed 1**

Monday, June 13, 2022

8:30 - 10:15 am PDT

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Chair:

8:30 **Doubly robust criterion for marginal structural models**

Takamichi Baba, The Graduate University for Advanced Studies/Shionogi & Co., Ltd.

8:50 **SURE theory in propensity score analysis**

Yoshiyuki Ninomiya, The Institute of Statistical Mathematics

9:10 **Robust univariate network meta-analysis without knowledge of within-study correlations: application to primary open-angle glaucoma**

Yu-Lun Liu, University of Texas Southwestern Medical Center

9:30 **Approximate maximum likelihood estimation of the mixture cure model from aggregated data**

John Rice, Colorado School of Public Health

9:50 **A Weighted Jackknife Approach Utilizing Linear Model-Based Estimators for Clustered Data**

Ruofei Du, University of Arkansas for Medical Sciences

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**Student Paper 1**

Monday, June 13, 2022

8:30 - 10:15 am PDT

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Chair: Student Paper Committee

8:30 **A Double Robust Estimator For Mann Whitney Wilcoxon Rank Sum Test When Applied for Causal Inference in Observational Studies**

Ruohui Chen, University of California, San Diego

8:50 **Model-assisted analyses of cluster-randomized experiments**

Fangzhou Su, University of California, Berkeley

9:10 **Fighting Noise with Noise: Causal Inference with Many Candidate Instruments**

Xinyi Zhang, University of Toronto

9:30 **Estimation based on nearest neighbor matching: from density ratio to average treatment effect**

Zhexiao Lin, University of Washington

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**WNAR Invited 4**

Monday, June 13, 2022

10:30 - 12:15 pm PDT

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**Advanced statistical methods for biomedical data**

Organizer & Chair: Esra Kurum, University of California, Riverside

10:30 **A functional model for studying common trends across trial time in eye tracking experiments**

Damla Senturk, University of California, Los Angeles

10:55 **Multilevel time-varying joint models for hospitalization and survival in patients on dialysis**

Esra Kurum, University of California, Riverside

11:20 **Discovering high-order interaction with signed iterative random forests**

Sumanta Basu, Cornell University

11:45 **Learning from Real-World Data About Combinatorial Treatment Selection for COVID-19**

Xinping Cui, University of California, Riverside

#### **WNAR Invited 5**

##### **Discussion Panel**

Monday, June 13, 2022

10:30 - 12:15 pm PDT

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#### **The alternative hypothesis: Underrepresented (bio)statisticians share graduate school experiences**

Organizer & Chair: Natalie Gasca, California Council on Science and Technology

10:30-12:15 **Maricela Cruz**, Kaiser Permanente Washington Health Research Institute

**Aaron Hudson**, University of California, Berkeley

**Amarise Little**, University of Washington

**Kyle Conniff**, University of California Irvine

#### **WNAR Invited 6**

Monday, June 13, 2022

10:30 - 12:15 pm PDT

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#### **Advancement of network modeling and clustering and applications in omics analysis**

Organizer & Chair: Wen Zhou, Colorado State University, Colorado School of Public Health

10:30 **Bootstrapping Network Data: Conditional versus Marginal Distributions**

Keith Levin, University of Wisconsin-Madison

10:55 **Root and community inference on preferential attachment model of networks**

Min Xu, Rutgers University

11:20 **Network Estimation by Mixing: Adaptivity and More**

Tianxi Li, University of Virginia

11:45 **Individual-centered partial information in social networks**

Xin Tong, University of Southern California

#### **Contributed 2**

Monday, June 13, 2022

10:30 - 12:15 pm PDT

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Chair:

10:30 **Comparing Confidence Distributions in Meta-Analysis**

Brinley Zabriskie, Brigham Young University

10:50 **A Two-Stage Decision Making Approach for Safety Studies**

Jessica Kim, FDA

11:10 **Using functional principal component analysis (fPCA) to quantify "active" versus "inactive" sitting patterns derived from wearable sensors**

Rong Zablocki, University of California, San Diego

11:30 **Nearest-Neighbor Geostatistical Models for Non-Gaussian Data**

Xiaotian Zheng, University of California Santa Cruz

11:50 **Latent trait shared-parameter mixed-models for missing ordinal ecological momentary assessment data**

John Cursio, The University of Chicago

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**Student Paper 2**

Monday, June 13, 2022

10:30 - 12:15 pm PDT

Chair: Student Paper Committee

10:30 **Inference after latent variable estimation for single-cell RNA sequencing data**

Anna Neufeld, University of Washington

10:50 **An Integrated Bayesian Framework for Multi-omics Prediction and Classification**

Anupreet Porwal, University of Washington Seattle

11:10 **A multivariate approach to conditional independence testing in microbial network construction**

Hongjiao Liu, University of Washington

11:30 **IBD-based estimation of X chromosome effective population size with application to sex-specific demographic history**

Ruoyi Cai, Department of Biostatistics, University of Washington

11:50 **Integrative cross-omics and cross-context analysis elucidates molecular links underlying complex diseases and traits**

Yihao Lu, University of Chicago

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**WNAR Invited 7**

Monday, June 13, 2022

1:45 - 3:30 pm PDT

**Innovative Advances in Functional Data Applications**

Organizer: Brian Kwan, University of California, Los Angeles

Chair: Jingjing Zou, University of California, San Diego

1:45 **A Bayesian Covariance Based Clustering for High Dimensional Tensors**

Aaron Scheffler, University of California, San Francisco

2:10 **Leveraging Functional Data Analysis Methods for Practical Health Applications**

Brian Kwan, University of California, Los Angeles

2:35 **Adaptive Functional Principal Component Analysis**

Jeff Goldsmith, Columbia University

3:00 **Minimax Powerful Functional Analysis of Covariance Tests for Longitudinal Genome-Wide Association Studies**

**WNAR Invited 8**

Monday, June 13, 2022

1:45 - 3:30 pm PDT

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**Recent Development in Mobile/Wearable Device Data Analysis**

Organizer: Jingjing Zou, University of California, San Diego

Chair: Loki Natarajan, University of California, San Diego

1:45 **Functional data analysis Inference in crossover designs with application to cat accelerometer data**

Ana-Maria Staicu, North Carolina State University

2:10 **Cumulative head impact exposure and the concussion risk: functional data analytic approach**

Jaroslav Harezlak, Indiana University

2:35 **A Riemann Manifold Model Framework for Longitudinal Changes in Physical Activity Patterns**

Jingjing Zou, University of California, San Diego

3:00 **Longitudinal functional principal component analysis on multi-level physical activity data**

Wenyi Lin, University of California, San Diego

**WNAR Invited 9**

Monday, June 13, 2022

1:45 - 3:30 pm PDT

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**Unmeasured confounding in causal inference: recent advances**

Organizer & Chair: Fan Xia, University of Washington

1:45 **Mediation analysis with unmeasured treatment-induced confounding**

Fan Xia, University of Washington

2:10 **The synthetic instrument method**

Linbo Wang, University of Toronto

2:35 **A Focusing Framework for Testing Bi-Directional Causal Effects with GWAS Summary Data**

Ting Ye, University of Washington

3:00 **Accounting for hidden bias in test-negative design studies of vaccine effectiveness leveraging double negative controls**

Xu Shi, University of Michigan

**Contributed 3**

Monday, June 13, 2022

1:45 - 3:30 pm PDT

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Chair:

1:45 **Modeling Sparse Data Using MLE with Applications to Microbiome Data**

Hani Aldirawi, California State University San Bernardino

2:05 **Caution When Inferring the Effect Direction in the Presence of Pleiotropy**

Sharon Lutz, Harvard Medical School



2:25 **Large scale single-cell multi-sample multi-condition data integration using scMerge2**

Yingxin Lin, The University of Sydney

2:45 **Statistical Analysis of Metagenomic Hi-C data: Bias Removal and Microbial Genome Retrieval**

Yuxuan Du, University of Southern California

3:05 **Spatiotemporal Zero-Inflated Bayesian Negative Binomial Regression Using Nearest Neighbor Gaussian Process and Polya-Gamma Mixtures**

Qing He, University of Central Florida

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**Student Paper 3**

Monday, June 13, 2022

1:45 - 3:30 pm PDT

Chair: Student Paper Committee

1:45 **Estimating relative survival after TEVAR for thoracic aortic aneurysm**

Hang Nguyen, Southern Methodist University

2:05 **Impact of correlations between prioritized outcomes on the net benefit and its estimate by generalized pairwise comparisons**

Kanako Fuyama, Hokkaido University

2:25 **Privacy-Preserving and Communication-Efficient Causal Inference for Hospital Quality Measurement**

Larry Han, Harvard University

2:45 **Wedding Table Cluster Prior with Exchangeability and Parallel Processing**

Charles Harrison, University of Central Florida

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**WNAR Invited 10**

Monday, June 13, 2022

3:45 - 5:30 pm PDT

**Functional and shape data analysis in imaging studies**

Organizer & Chair: Eardi Lila, Department of Biostatistics, University of Washington

3:45 **A functional data approach to identifying Alzheimer's disease from manifold imaging data**

Eardi Lila, University of Washington

4:10 **Gaussian Copula Function-on-Scalar Regression in Reproducing Kernel Hilbert Space**

Linglong Kong, University of Alberta

4:35 **Statistical Frameworks for Variable Selection with 3D Shapes and High-Resolution Imaging**

Lorin Crawford, Microsoft Research

5:00 **Tangent Functional Canonical Correlation Analysis for Densities and Shapes, with Applications to Multimodal Imaging Data**

Sebastian Kurtek, The Ohio State University

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**WNAR Invited 11**

Monday, June 13, 2022

3:45 - 5:30 pm PDT

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**Modern statistical learning methods for spatial and imaging data**

Organizer & Chair: Lily Wang, George Mason University

3:45 **Simulation Experiments and Uncertainty Quantification in Remote Sensing**

Emily Kang, University of Cincinnati

4:10 **A Scalable Partitioned Approach to Model Massive Nonstationary Non-Gaussian Spatial Datasets**

Seiyon Lee, George Mason University

4:35 **Big Imaging Data Learning: A Parallel Solution**

Shan Yu, University of Virginia

5:00 **Statistical Inferences on Neuroimaging Data via Deep Neural Networks**

Jian Kang, University of Michigan

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**WNAR Invited 12**

Monday, June 13, 2022

3:45 - 5:30 pm PDT

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**Bayesian Clinical Trial Designs and Analyses**

Organizer: Masataka Taguri, Yokohama City University

Chair: Kentaro Takeda, Astellas

3:45 **Model calibration approaches for model uncertainty of dose-efficacy relationship in phase I trials for monotherapy of molecularly targeted agents**

Hiroyuki Sato, Tokyo Medical and Dental University

4:10 **Constrained hierarchical Bayesian model for latent subgroups in basket trials with two classifiers**

Shufang Liu, Astellas

4:35 **Dynamic borrowing from multiple historical control data by shrinkage priors**

Tomohiro Ohigashi, University of Tsukuba

5:00 **U-BOIN: a utility-based two-stage phase I-II design to identify maximum tolerated dose and optimal biological dose**

Yanhong Zhou, The University of Texas MD Anderson UTHealth Graduate School of Biomedical Sciences

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**Contributed 4**

Monday, June 13, 2022

3:45 - 5:30 pm PDT

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Chair:

3:45 **Time Series Forecasting and Forecast Intervals with Random Forests**

Barbara Bailey, San Diego State University

4:05 **Flexible variable selection in the presence of missing data**

Brian Williamson, Kaiser Permanente Washington Health Research Institute

4:25 **Sampling from multimodal distributions using tempered Hamiltonian transitions**

Joonha Park, University of Kansas

4:45 **Model-agnostic Explanations of Survival Prediction Models**

Krithika Suresh, University of Colorado  
5:05 **Parallel Tempering With a Variational Reference**  
Nikola Surjanovic, University of British Columbia

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**Student Paper 4**

Monday, June 13, 2022

3:45 - 5:30 pm PDT

Chair: Student Paper Committee

3:45 **A computationally efficient approach to fitting large scale penalized cox models**

Aliasghar Tarkhan, PhD student, Department of Biostatistics, University of Washington

4:05 **Multilevel hybrid principal components analysis for region-referenced functional EEG data**

Emilie Campos O'Banion, University of California, Los Angeles

4:25 **Bayesian Functional Partial Membership Models**

Nicholas Marco, University of California, Los Angeles

4:45 **Outlier Detection for Brain Network Data**

Pritam Dey, Department of Statistical Science, Duke University

5:05 **Proximal MCMC for Bayesian Inference of Constrained and Regularized Estimation**

Xinkai Zhou, University of California, Los Angeles

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**WNAR Invited 13**

Tuesday, June 14, 2022

8:30 - 10:15 am PDT

**Novel statistical methods for analyzing neuroimaging data**

Organizer: Cai Li, St. Jude Children's Research Hospital

Chair: Yimei Li, St. Jude Children's Research Hospital

8:30 **Biobank-scale Multi-organ Imaging Genetics: Clinical and Statistical Advances**

Bingxin Zhao, Purdue University

8:55 **Single-index models with functional connectivity network predictors**

Luo Xiao, North Carolina State University

9:20 **A High-dimensional Mediation Model for a Neuroimaging Mediator**

Yimei Li, St. Jude Children's research hospital

9:45 **Heterogeneity Analysis on Multi-state Brain Functional Connectivity and Adolescent Neurocognition**

Yize Zhao, Yale University

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**WNAR Invited 14**

Tuesday, June 14, 2022

8:30 - 10:15 am PDT

**Functional Data Analysis: New Directions and Innovations**

Organizer & Chair: Lily Wang, George Mason University

8:30 **Statistical Inference for Mean Functions of 3D Functional Objects**

- Guannan Wang, College of William and Mary
- 8:55 **Prediction Intervals for Multiple Functional Regression**  
Kehui Chen, University of Pittsburgh
- 9:20 **Adaptive Frequency Band Analysis for Functional Time Series**  
Pramita Bagchi, George Mason University
- 9:45 **Q-learning with Functional Imaging Features**  
Xinyi Li, Clemson University

**WNAR Invited 15**

Tuesday, June 14, 2022

8:30 - 10:15 am PDT

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**Adaptive Design in Clinical Trials**

Organizer: Suhwon Lee, University of Missouri

Chair: Jessica Kohlschmidt, Ohio State University

- 8:30 **Designs for Joint Estimation of a Target Dose and the Slope of a Dose-Response Function at the Target**  
Jose Moler, Universidad Publica de Navarra
- 8:55 **Likelihood-Based Early Stopping Decisions**  
Nancy Flournoy, University of Missouri - Columbia
- 9:20 **Two-stage adaptive enrichment design for randomized clinical trials comparing a treatment with a control**  
Rosamarie Frieri, University of Bologna
- 9:45 **Optimal timing for an interim analysis for a primary endpoint under model assumptions**  
Seung Won Hyun, Tempus Labs

**Contributed 5**

Tuesday, June 14, 2022

8:30 - 10:15 am PDT

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Chair:

- 8:30 **Confidence Envelopes for Model Selection Criteria and Post-Model Selection Inference**  
Alex Trindade, Texas Tech University
- 8:50 **Information criteria for detecting change-points in the Cox proportional hazards model**  
Ryoto Ozaki, The Graduate University for Advanced Studies/Chugai Pharmaceutical Co., Ltd.
- 9:10 **Real-Time Change Point Detection in High-Dimensional Linear Models**  
Suthakaran Ratnasingam, California State University, San Bernardino
- 9:30 **Clustering in High Dimensions**  
William Lippitt, University of Colorado Denver AMC
- 9:50 **Modeling Dynamic Correlation Structure in Multi-Omics Data from Single-Cell Experiments**

**Student Paper 5**

Tuesday, June 14, 2022

8:30 - 10:15 am PDT

Chair: Student Paper Committee

8:30 **Shape-Based Clustering of Daily Weigh-In Trajectories using Dynamic Time Warping**

Samantha Bothwell, University of Colorado Anschutz

8:50 **Bayesian random change point mixed model analysis of cognitive performance trajectories to identify eligible patients for randomized clinical trials**

Lianlian Du, The University of Wisconsin - Madison

9:10 **Joint Modeling of Longitudinal Processes and Mortality via Mixed Effects State Space Models with Applications to Dialysis Data**

Mingzhao Hu, University of California, Santa Barbara

9:30 **Variable Importance for Fixed Effects in Linear Mixed Model**

Yongzhe Wang, University of Washington

9:50 **Nonlinear Mixed-Effects Models for HIV Viral Load Trajectories Before and After Antiretroviral Therapy Interruption, Incorporating Left Censoring**

Sihaoyu Gao, University of British Columbia

**WNAR Invited 16**

Tuesday, June 14, 2022

10:30 - 12:15 pm PDT

**Recent Development with Complex Event Time Data**

Organizer & Chair: Fei Gao, Fred Hutchinson Cancer Research Center

10:30 **Efficient Estimation of Semiparametric Transformation Model With Interval-Censored Data in Two-Phase Cohort Studies**

Fei Gao, Fred Hutchinson Cancer Research Center

10:55 **Semiparametric proportional hazards model for left-truncated and interval-censored time-to-event outcome using auxiliary and validated data with application to HCHS/SOL data**

Noorie Hyun, Kaiser Permanente Washington Health Research Institute

11:20 **Semiparametric regression analysis of partly interval-censored failure time data with application to an AIDS clinical trial**

Qingning Zhou, University of North Carolina at Charlotte

11:45 **Statistical inference for recurrent event processes under shape heterogeneity**

Yifei Sun, Columbia University

**WNAR Invited 17**

Tuesday, June 14, 2022

10:30 - 12:15 pm PDT

**Advances and applications in health precision and prediction of events with correlated data**

Organizer & Chair: Elizabeth Juarez-Colunga, University of Colorado Anschutz Medical Campus

10:30 **Using the Generalized Linear (Mixed) Model to Personalize Interventions**

Ann Lazar, University of California, San Francisco

10:55 **Identification of extreme clusters in mixed effects models using optimal weighted predictions**

Charles McCulloch, University of California, San Francisco

11:20 **Predicting events with longitudinal sparse data**

Kristen Miller, University of Colorado Anschutz Medical Campus

11:45 **Floor Discussion**

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**WNAR Invited 18**

Tuesday, June 14, 2022

10:30 - 12:15 pm PDT

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**Network-Based and Functional Data Analysis Approaches for OMICS Data**

Organizer & Chair: Debmalya Nandy, Department of Biostatistics & Informatics, Colorado School of Public Health, University of Colorado Anschutz Medical Campus

10:30 **Dynamic Biomarker Discovery for Childhood Obesity Using Functional Data Analysis**

Ana Maria Kenney, University of California, Berkeley

10:55 **RCFGL: Rapid Condition adaptive Fused Graphical Lasso**

Souvik Seal, CU Anschutz Medical Campus

11:20 **NetSHy: Network Summarization via a Hybrid approach leveraging topological properties**

Thao Vu, Colorado School of Public Health

11:45 **Large-scale genomic study reveals robust activation of the immune system following advanced Inner Engineering meditation retreat**

Vijayendran Chandran, University of Florida

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**WNAR Invited 19**

Tuesday, June 14, 2022

10:30 - 12:15 pm PDT

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**Advances in Single-Cell Multi-omics Analysis**

Organizer: Lingling An, University of Arizona

Chair: Hongmei Jiang, Northwestern University

10:30 **MIRA: Joint regulatory modeling of multimodal expression and chromatin accessibility in single cells**

Cliff Meyer, Dana-Farber Cancer Institute

10:55 **Model-free prediction test with application to genomics data**

Kathryn Roeder, Carnegie Mellon University

11:20 **Computational principles and statistical challenges in single-cell data integration**

Lingling An, University of Arizona

11:45 **JSNMF enables effective and accurate integrative analysis of single-cell multiomics data**

Zhixiang Lin, Department of Statistics, The Chinese University of Hong Kong

Chair: Student Paper Committee

10:30 **Federated Offline Reinforcement Learning**

Doudou Zhou, University of California, Davis

10:50 **Metaheuristics for finding efficient longitudinal designs for sustained release lithium in bipolar disorder**

Mitchell Schepps, University of California, Los Angeles

11:10 **Estimating Optimal Infinite Horizon Dynamic Treatment Regimes via pT-Learning**

Wenzhuo Zhou, University of Illinois Urbana Champaign

11:30 **Doubly Robust Calibration of Prediction Sets under Covariate Shift**

Yachong Yang, University of Pennsylvania, Wharton, Department of Statistics and Data Science

11:50 **A reduced rank regression model for microbiome-omics data integration**

Ying Dai, Oregon State University

**Recent development of statistical methodologies in microbiome data analysis**

Organizer: Hongmei Jiang, Northwestern University

Chair: Lingling An, University of Arizona

1:45 **DeepLINK: Deep learning inference using knockoffs with applications to genomics**

Fengzhu Sun, University of Southern California

2:10 **Differential abundance analysis to identify functionally different microbes**

Michael Sohn, University of Rochester

2:35 **Microbial Interactions and Community Stability from Longitudinal Microbiome Study**

Huilin Li, New York University

3:00 **Cluster Analysis of Longitudinal Profiles for Compositional Count Data to Study the Competition-Colonization Trade-Off in Ecology**

Yuan Jiang, Oregon State University

**Emerging Challenges and Opportunities in Statistics for Higher-Education and Organizations**

Organizer & Chair: James Molyneux, Oregon State University - Department of Statistics

1:45 **Assessing the Effect of Scholarships on Student Success at Oregon State University**

Claudio Fuentes, Oregon State University

**2:10 Teaching the "Right" Data Science and Statistics to an Audience**

James Molyneux, Oregon State University Department of Statistics

**2:35 Enhancing the Teaching of Computational Methods for Undergraduate Students**

Njesa Totty, Oregon State University

**3:00 Scaling the Teaching of Statistics and Data Science for Varied Learning Modes**

Vik Gopal, National University of Singapore

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**WNAR Invited 22**

Tuesday, June 14, 2022

1:45 - 3:30 pm PDT

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**Recent advances in clinical drug development**

Organizer: Ting Ye, University of Washington

Chair: Yanyao Yi, Eli Lilly and Company

**1:45 Evaluation of machine learning approaches for estimating individualized treatment regimens for time-to-event outcomes in observational studies**

Ilya Lipkovich, Eli Lilly

**2:10 Application of AI to Clinical Trials**

Qi Tang, Sanofi

**2:35 Inference on Selected Subgroup: One Subgroup, Two Trials, and Three Evaluations**

Xinzhou Guo, Hong Kong University of Science and Technology

**3:00 Probability of Study Success (PrSS) assessment based on Bias-adjusted Bayesian Network Meta-Analysis (BaBNMA)**

Ying Zhang, Eli Lilly

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**IMS Invited 1**

Tuesday, June 14, 2022

1:45 - 3:30 pm PDT

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**New frontiers in nonparametric learning, sparse learning, and deep learning**

Organizer & Chair: Xinyi Li, School of Mathematical and Statistical Sciences, Clemson University

**1:45 Dimension reduction of longitudinal microbiome data by tensor functional SVD**

Anru Zhang, Duke University

**2:10 Interval Privacy: A New Framework for Privacy-Preserving Data Collection**

Jie Ding, University of Minnesota

**2:35 Optimal and Safe Estimation for High-Dimensional Semi-Supervised Learning**

Yang Ning, Cornell University

**3:00 Large Scale Prediction with Decision Trees**

Jason Klusowski, Princeton University

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**Student Paper 7**

Tuesday, June 14, 2022

1:45 - 3:30 pm PDT

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Chair: Student Paper Committee



**1:45 Exploring Author Roles in Biomedical Publication Networks Using Interactive Visualization**

Karen Kanaster, Colorado School of Public Health, University of Colorado Anschutz Medical Campus

**2:05 Model-Based Voronoi Linkage between Point-Referenced Data and Areal Data in Spatial Analysis with Application to Brazilian Election 2018**

Lucas Godoy, University of Connecticut

**2:25 A Computationally Efficient Approach to Fully Bayesian Benchmarking**

Taylor Okonek, University of Washington

**2:45 Regression Modeling of Network-Structured Count Data with Exchangeable Dependencies**

Wenqin Du, Colorado State University

**3:05 Identify shortcomings of Estimators of Discriminative Performance in Time-to-Event Analyses: A Comparison Study**

Ying Jin, University of Colorado, Anschutz Medical Campus

**WNAR Invited 23**

Wednesday, June 15, 2022

8:30 - 10:15 am PDT

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**Novel borrowing approaches using real world data for clinical trials**

Organizer & Chair: Herb Pang, Genentech

**8:30 Innovative clinical trial designs with hybrid control: challenges and opportunities**

Jiawen Zhu, Genentech

**8:55 Evaluation of Statistical Methods for Hybrid External Controls in Clinical Trials**

Xiang Zhang, CSL Behring

**9:20 Theory and Application of Integrative Analysis of Randomized Clinical Trials with Real-World Data**

Xiaofei Wang, Duke University

**9:45 Floor Discussion**

**WNAR Invited 24**

Wednesday, June 15, 2022

8:30 - 10:15 am PDT

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**Statistical modeling, forecasting and optimal designing of patient enrollment under various restrictions in multicenter clinical trials**

Organizer: Mitchell Schepps, University of California, Los Angeles

Chair: Weng Kee Wong, University of California, Los Angeles

**8:30 Bayesian Accrual Modeling and Prediction in Multicenter Clinical Trials with Varying Center Activation Times**

Junhao Liu, Novartis

**8:55 Multiple-objective metaheuristic optimization algorithms for complex clinical trial enrollment designs.**

Mitchell Schepps, University of California, Los Angeles

9:20 **Statistical modeling of restricted enrollment and optimal cost-efficient design in multicenter clinical trials**

Vladimir Anisimov, Amgen

9:45 **Optimal design of experiments with the observation censoring driven by random enrollment of subjects**

Xiaoqiang Xue, Syneos Health

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**WNAR Invited 25**

Wednesday, June 15, 2022

8:30 - 10:15 am PDT

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**What's new in spatial statistics?**

Organizer & Chair: Weining Shen, University of California, Irvine

8:30 **BAMDT: Bayesian Additive Partial Multivariate Decision Trees for Nonparametric Regression**

Huiyan Sang, Texas A&M University

8:55 **Mapping the Prevalence of Demographic and Health Indicators Using Household Surveys**

Zehang Li, University of California, Santa Cruz

9:20 **Semi-parametric estimation of spatially indexed probability densities with application to regional soil erosion assessment**

Zhengyuan Zhu, Iowa State University

9:45 **Floor Discussion**

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**Student Paper 8**

Wednesday, June 15, 2022

8:30 - 10:15 am PDT

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Chair: Student Paper Committee

8:30 **Flexible estimation of the conditional survival function via observable regression models**

Charles Wolock, University of Washington

8:50 **Nonparametric Estimation of the Potential Impact Fraction and Population Attributable Fraction**

Colleen Chan, PhD student

9:10 **Long-term effect estimation when combining clinical trial and**

Gang Cheng, University of Washington

9:30 **Evaluating and Improving Methods for Estimating the Effective Reproduction Number**

Isaac Goldstein, University of California, Irvine

9:50 **Disease Analytics: COVID-19 Across Canada**

Matthew Parker, Simon Fraser University

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**WNAR Invited 26**

Wednesday, June 15, 2022

10:30 - 12:15 pm PDT

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**New Developments of Bayesian modeling and applications**

Organizer & Chair: Hsin-Hsiung Huang, University of Central Florida

10:30 **Sparse Bayesian Matrix-variate Regression with High-dimensional Binary Response Data**

Hsin-Hsiung Huang, University of Central Florida

10:55 **Analyzing Zero-inflated Data**

Jie Yang, University of Illinois at Chicago

11:20 **Ultra-high Dimensional Bayesian Matrix-variate logistic regression Variable Selection**

Shao-Hsuan Wang, National Central University, Taiwan

11:45 **Robust Regularized Low-Rank Matrix Models**

Teng Zhang, University of Central Florida

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**WNAR Invited 27**

Wednesday, June 15, 2022

10:30 - 12:15 pm PDT

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**The New England Journal of Statistics in Data Science (NEJSDS) Invited Papers on Innovative Clinical Trial Designs**

Organizer & Chair: Colin Wu, National Heart, Lung and Blood Institute, National Institutes of Health

10:30 **Flexible Conditional Borrowing Approaches for Leveraging Historical Data in the Bayesian Design of Superiority Trials**

Ming-Hui Chen, University of Connecticut

10:55 **A Novel Design for Establishing Mixed Chimerism and Dose-finding in Transplantation and Cancer Trials**

Ying Lu, Stanford University

11:20 **A Unified Decision Framework for Phase I Dose-Finding Designs**

Yuan Ji, University of Chicago

11:45 **Floor Discussion**

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**Student Paper 9**

Wednesday, June 15, 2022

10:30 - 12:15 pm PDT

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Chair: Student Paper Committee

10:30 **A data adaptive rank-based procedure for assessing reproducibility of high-throughput experiments.**

Austin Ellingworth, Colorado State University

10:50 **Efficiency loss with binary pre-processing of continuous monitoring data**

Paula Langner, University of Colorado Anschutz Medical Campus

11:10 **Efficient Algorithms and Implementation of a Semiparametric Joint Model for Longitudinal and Competing Risk Data: With Applications to Massive Biobank Data**

Shanpeng Li, University of California, Los Angeles

11:30 **Fast Distributed Principal Component Analysis of Large-Scale Federated Data**

Shuting Shen, Harvard University

**11:50 Regression in Tensor Product Spaces by the Method of Sieves**

Tianyu Zhang, University of Washington