THE UNIVERSITY OF OKLAHOMA HEALTH SCIENCES CENTER

SCTR Oklahoma Shared Clinical & Translational Resources

Biostatistics, Epidemiology, and Research Design Key Component Activity

Hudson College of Public Health
Department of Biostatistics and Epidemiology

R SHORT COURSE PART II (ADVANCED TOPICS)

March 1, 2021 – April 30, 2021

Short Course Faculty:

Michael Anderson, PhD
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Location:

The short course sessions are offered virtually through Zoom.

Registration:

One-time online registration required.

The deadline for registration is 2/24/2021. Upon registration, you may choose the option of registering for all sessions or selected sessions. You may also choose to attend live virtual sessions or to watch recorded videos. The registration link is as following:

https://redcap.ouhsc.edu/redcap/surveys/?s=87EPM4DA34

Schedule:

The short course was designed for 12 sessions during the spring semester, 2021. All sessions will be conducted by using Zoom. Recorded videos will be posted on the OSCTR website. Each session will be two hours in duration (1-hour lecture and 1-hour in-class practice). Participants are expected to have taken the intro-level R course and have basic knowledge about R. In addition, participants are expected to have familiarity with intro-level statistics including coursework or training in statistical methods, linear models, and frequency data analysis. Registrants may participate in all sessions or choose selected topics. Attendance in prior sessions is not required, except for Topic 5 where Bayesian statistics Part I should be completed prior to attending Bayesian statistics Part II. If you can't attend some sessions due to time conflict, you can still watch the recorded videos later, but prior registration is still required (See above registration guideline).

Topic / activity	Prerequisites	Date
Topic1: Regression models including linear regression and Nonlinear model (Xu)	Statistical Methods, Linear Model and Nonlinear model	3/1: 1pm-3pm
Topic2: Generalized linear models, Logistic regression models (Xu)	Statistical Methods and Frequency data analysis	3/5: 1pm-3pm
Topic3: Cart and RF (Zhao)	Statistical Methods, Linear Regression, and Frequency Data Analysis	3/9: 9am-11am

Topic4: Nonparametric statistics (Ding)	Statistical Methods and Frequency data analysis	3/10: 1pm-3pm
Topic5: Bayesian statistics Part I (Anderson)	Statistical Methods	3/23: 9am-11am
Topic5: Bayesian statistics Part II (Anderson)	Statistical Methods	3/30: 9am-11am
Topic6: Missing data analysis (Chen)	Statistical Methods, Linear Regression, Logistic Regression, Frequency Data Analysis	4/30: 1pm-3pm
Topic7: Survival analysis (Ding)	Statistical Methods and Frequency data analysis	4/7: 1pm-3pm
Topic8: R graphics (Xu)	Statistical Methods and Frequency Data Analysis	4/9: 1pm-3pm
Topic9: Monte Carlo simulation (Chen)	Statistical Methods, Linear Regression, and Frequency Data Analysis	4/16: 1pm-3pm
Topic10: Linear Mixed Models (Zhao)	Statistical Methods, Linear Regression, and Frequency data analysis	4/20: 9am-11am
Topic11: Generalized Estimating Equations (Zhao)	Statistical Methods, Linear Regression, and Frequency data analysis	4/27: 9am-11am

Format:

The format includes remote didactic lectures and hands-on exercises during a lab session. Exercises and answer keys will be posted on the course website. Sessions will be recorded and videos also will be posted following each session.

Course materials should be downloaded or printed for personal use prior to each session from the following website. Students are required to download R-4.0.3 on their computers before attending the classes

Website: http://osctr.ouhsc.edu/r-short-course

Materials for the First Session:

Please have a laptop with R software installed:

a. Mac: https://cran.r-project.org/bin/macosx/
b. Windows: https://cran.r-project.org/bin/windows/base/

Please have a paper or electronic copy of the course materials. These can be found on the course website: http://osctr.ouhsc.edu/r-short-course

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Short Course Faculty Biographical Summaries:

Dr. Mike Anderson is Associate Professor of Biostatistics at OUHSC. He obtained a BA in Statistics from Utah State University and an MS and PhD in Statistics from Kansas State University. His research interests are Bayesian probability models applied to high dimensional data, software development, and statistical education. Dr. Anderson has been using R for 15 years and has created an R package for conducting Bayesian probability matching of DNA Barcodes ('bdoc' package on CRAN's archive https://cran.r-project.org/src/contrib/Archive/bdoc/). Dr. Anderson is the primary lecturer for the Applied Bayesian Analysis course offered in the Hudson College of Public Health and has been invited to offer short courses on Applied Bayesian Methods at the Christian Medical College in Vellore India, and for the Department of Defense at Edwards Air Force Base in California. Disclosure - Dr. Anderson is part owner of Bayesic Technologies LLC, a small business that creates software to conduct Bayesian statistical analyses. No proprietary software will be used in this short course.

Dr. Sixia Chen is Assistant Professor of Biostatistics and Epidemiology at the University of Oklahoma Health Sciences Center (OUHSC). He has served as the director of Novel Methodologies Unit within the Biostatistics, Epidemiology, and Research Design Core of the Oklahoma Shared Clinical and Translational Resources (OSCTR) since 2018. He graduated with a BA in Mathematics from Fudan University at Shanghai, China in 2007 and PhD (2012) in Statistics from Iowa State University. His dissertation developed efficient methods to handle complex survey data with missing values. He worked as senior sampling statistician in Westat from 2012 to 2015. He has been a full-time faculty member at OUHSC since 2015 and has continued to develop missing data methods as

well as survey sampling, nonparametric and semiparametric methods. Dr. Chen has served as Associate Editor for *Journal of Korean Statistical Society* since 2018, Associate Editor for *Scandinavian Journal of Statistics* and Associate Editor for *Journal of Survey Statistics and Methodology* since 2019 and published more than 23 independent statistical methodological papers in leading statistical journals including *Biometrika, Annals of Applied Statistics, Journal of Multivariate analysis, Journal of Survey Statistics and Methodology and Statistica Sinica* and coauthored more than 24 collaborative papers in other fields. For more detailed information, please visit Dr. Chen's personal website at https://sites.google.com/view/schen0713/%E9%A6%96%E9%A1%B5

Dr. Kai Ding is Associate Professor at the University of Oklahoma Health Sciences Center. He graduated with a BA in Statistics from Fudan University in Shanghai, China in 2002, an MS in Statistics from University of Kentucky in 2005, and a PhD in biostatistics from University of North Carolina at Chapel Hill in 2010. He is a member of the Biostatistics Research Design and Shared Resources at the Stephenson Cancer Center. His expertise includes semiparametric modeling, survival analysis, high dimensional data, gastrointestinal and gynecological cancers, and ophthalmology.

Dr. Chao Xu is an Assistant Professor at the University of Oklahoma Health Sciences Center. He is part of the Stephenson Cancer Center Biostatistics and Research Design Shared Resource. He has a broad background in statistical genetics, biostatistics, bioinformatics, and genetic epidemiology, with specific training and expertise in genetic and genomic studies of complex diseases, such as the osteoporosis and cancer. He received a PhD in Biostatistics from Tulane University, US. He has accumulated more than 10 years of research experience participating in projects supported by NIH, including statistical tests of candidate causal genes, identification of disease-related proteins, epigenomewide DNA methylation study, and trans-omics integration of multi-omics studies.

Dr. Daniel Zhao is Professor of Biostatistics at OUHSC. He is a member of the Biostatistics, Epidemiology, and Research Design Core of the Oklahoma Shared Clinical and Translational Resources (OSCTR). He is also the Associate Director of the Biostatistics Research Design and Shared Resources at the Stephenson Cancer Center. Previously, he worked at University of Texas Southwestern Medical Center and Eli Lilly. He obtained a Bachelor in Mathematics from Peking University and a PhD in Statistics from the Iowa State University. His research areas included longitudinal data analysis, misclassification, and adaptive clinical trial designs.

For additional information about the short course, please contact Dr. Sixia Chen at Sixia-Chen@ouhsc.edu.