THE UNIVERSITY OF OKLAHOMA HEALTH SCIENCES CENTER

OSCTR Oklahoma Shared Clinical & Translational Resources

Biostatistics, Epidemiology, and Research Design
Key Component Activity

OSCTR Biostatistics, Epidemiology and Research Design Core

WORKSHOP

INTRODUCTION TO CLASSIFICATION AND REGRESSION TREES (CART) AND RANDOM FORESTS

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Department of Biostatistics & Epidemiology
The University of Oklahoma Health Sciences

Wednesday, March 5th, 2025
12:00 PM – 2:00 PM

Physical: Hudson College of Public Health Auditorium (CHB 320)

Virtual: Zoom **Meeting ID:** 955 6918 5971 **Passcode:** 30139218

Box lunches will be provided for the first 15 attendees.

Registration required in advance for this meeting.

After registration, you will receive a confirmation email containing the Zoom link and information about the workshop materials.

DATE: March 5th, 2025
TIME: 12:00 PM – 2:00 PM
LOCATION: Hudson College of Public Health Auditorium (CHB 320)
FORMAT: Lecture with in-class, hands-on practice exercises

SOFTWARE:

- Prior to the workshop, please install the following software on your laptop.
  - R (https://www.r-project.org/)
  - RStudio Desktop: (https://posit.co/download/rstudio-desktop/)
- Please bring your laptop to the workshop so you can complete the in-class exercises.

PREREQUISITES:

- Basic R programming (variables, functions, loops, etc.)
- Knowledge of statistical methods such as linear regression and logistic regression.

DESCRIPTION:

- Decision trees are commonly used in many areas including patient care and predictive modeling.
- CART can construct decision trees for categorical or continuous predictors and outcomes.
- Random forests address overfitting issues in CART by generating multiple decision trees and constructing an ensemble prediction (average value for regression trees; majority vote for classification trees).
- In this workshop, we will discuss some commonly used R packages to generate decision trees and fit random forests to different types of data.

WORKSHOP CONTENT:

1. Introduction to decision trees.
2. Introduction to supervised-learning classifiers and performance metrics.
3. Classification and regression trees.
4. Validation methods for machine-learning algorithms (e.g., 80/20 split, k-fold, leave-one-out).
5. Random forests.

COURSE MATERIALS:

- Lecture slides, example code, and practice datasets may be downloaded prior to attendance, printed, and saved for personal use.
- Access materials at https://osctr.ouhsc.edu/seminars/short-course.

END OF WORKSHOP EVALUATION SURVEY:

- Please complete the survey at the following link: https://bbmc.ouhsc.edu/redcap/surveys/?s=W3RXNL99M748F3RM

- You will also receive the link by email after the workshop.

REGISTRATION:

- Registration is required by 6:00 PM on March 4th.
- Registration can be completed at https://osctr.ouhsc.edu/seminars/short-course.

SPONSOR ACKNOWLEDGEMENT:

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PARKING:

- The College of Public Health Building is located on the northeast corner of 13th Street and Phillips Avenue. Parking is available on the north side of the building.
- If you are driving north on Phillips Avenue, you will see a sign for **Lot 14E** on the east side of the street. Pull into this lot.
- If the gate is down, please press the button on the speaker box and indicate that you are attending a workshop in the College of Public Health Building.

FACULTY BIOGRAPHICAL SUMMARY:

- Dr. Dvorak is a Senior Research Biostatistician in the Department of Biostatistics and Epidemiology at the Hudson College of Public Health. He has over 10 years of experience in data management, statistical consulting, model-building, and automation. He has worked with investigators in various content areas including ophthalmology, endocrinology, oncology, orthopedic surgery, cardiology, internal medicine, tobacco, and speech-language pathology. He has taught undergraduate and graduate courses in statistics and programming, and has delivered numerous seminars and presentations at the national and international levels.