Workshop on R and movement ecology:
Hong Kong University, Jan 2018

Eric Dougherty, Dana Seidel, Wayne Getz

Lecture 1
Introductions & Logistics

DEPARTMENT *of* ENVIRONMENTAL
SCIENCE, POLICY, AND MANAGEMENT
ESPM

Berkeley
UNIVERSITY OF CALIFORNIA

College of
Natural Resources

Wayne Getz

Prof. Getz has been a professor at UC Berkeley since 1979. Having trained over 50 graduate and post graduate students, his specific research interests include population modeling epidemiology and resource wildlife management.

https://nature.berkeley.edu/getzlab/
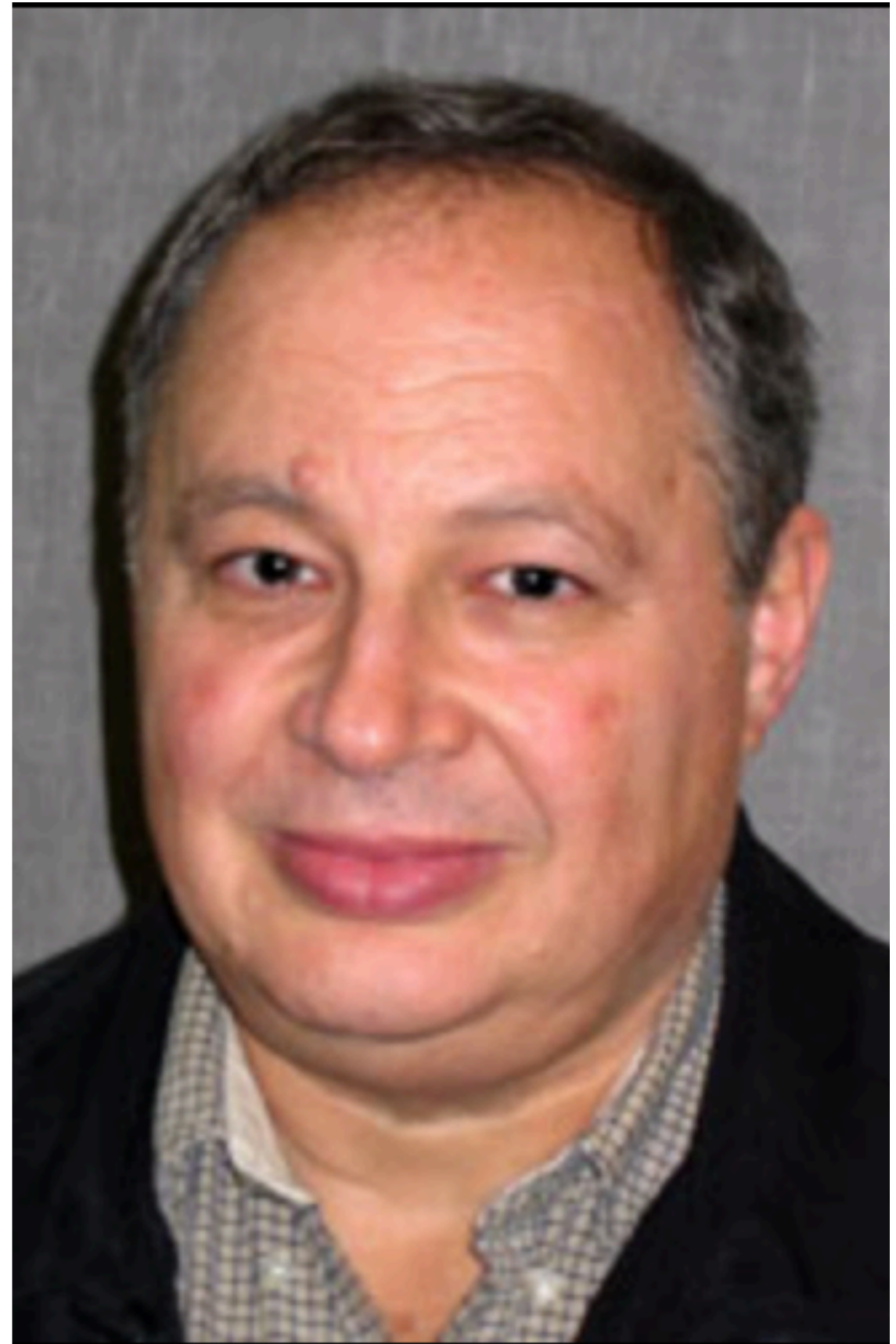
Eric Dougherty

Eric Dougherty is a 5th year PhD student interested in the transmission of infectious disease in wildlife, particularly when pathogens are environmentally-borne. Using agent-based modeling methods, he attempts to determine the mechanisms by which disease is maintained in populations and communities, and explore the conditions that result in large outbreaks.

Dana Seidel

Dana is a 4th year PhD student with a background as a movement ecologist and data scientist. In 2016, Dana completed a 2 year data science fellowship with the NSF. At UC Berkeley, she has taught courses including Data Science for Global Change Biology and Introduction to Ecological Data Analysis both using R. Her research focuses on the movement of large mammals and their diseases, especially those with environmental reservoirs.

Let us know about you!

- Name

- Affiliation

- Research topic or interest

- Experience in R or other programming languages (please specify)

Ice Breaker

Some logistics…

https://github.com/dpseidel/MovEco-R-Workshop

Goals & Structure

- This workshop is aimed to take movement researchers from introductory data manipulation in R to agent based movement simulation in 8 days.

- Most days will be structured around a single lecture on movement ecology theory or research, 2 live-coding sessions where we introduce the practical steps to assess certain movement metrics in R, and a hands on session where we will provide activities and be available to help you work with your own movement data.

- See our full schedule in the github repo.

Content

- Basics in R
- Spatial data in R
- Extracting movement path metrics
- Home Range Estimation
- Selection Analysis
- SpaceTime metrics
- Behavioral State Analysis
- Movement "syndrome" classification
- Simulating movement
- Agent based models

Software

Throughout this workshop we will be using both:

- R: https://www.r-project.org/

- Rstudio: https://www.rstudio.com/

R packages we'll need

- devtools
- rgdal
- rgeos
- tidyverse
- sf
- sp
- ggplot2 (developer's version)
- mapview (developer's version
- adehabitat
- adehabitatLT
- adehabitatHR
- move
- raster

Use:
`install.packages()` function inside R.

For more instruction, see installation tips on the front page of our github repo.

Github

- All our materials are hosted on Github
  https://github.com/dpseidel/MovEco-R-Workshop

- You don't need an account, you can simply download the materials each day as needed.

- If you do have an account, you will likely find it simplest to regularly pull from our repo or fork our repo to your own github account and commit your own progress along with the workshop.

Note: As this is the first run of this workshop and we want to be able to adapt our schedule to your experience level, interests, and needs, we will likely make some changes to the files as we progress. We will let you know if you need to update your fork or files as we go along.

Github, cont.

Given the time available, we will not be teaching version control, git, or github in this workshop, however if you're interested in exploring more, and do most of your work in R, we highly recommend using Rstudio as a simple git client and would refer you to http://happygitwithr.com/ for more information.

Also worth noting, if you are a student, you should qualify for the github student developer pack.
https://education.github.com/pack

Additional Resources

- [The R for DataScience book](#)

- [Rstudio Cheatsheets](#)!

- [Jamie Afflerbach's Spatial Analysis in R tutorials and repo](#)

- [Geocomputation with R book](#)

- [The r-spatial blog & website](#)

- [The Tidyverse website/blog](#)

- Join the [#Rstats](#) community!