**Learning Objectives**

After this week’s lecture you are expected to able to do the following:

*(Computational LOs)*

1. **~~Compare statistical distributions~~** ~~with respect to their parameters, the type of data they handle (discrete or continuous), and their assumptions~~
2. **~~Utilize distributions~~** ~~for simulations, statistical tests, and as models for fitting~~
3. Implement **randomization tests** in appropriate scenarios. Specifically, this includes…
   1. **Bootstrapping**
   2. **~~Jack-knifing~~**
4. **Analyze and manipulate images** in R. This includes (but is not limited to)…
   1. Basic color editing (brightness, contrast, saturation etc.)
   2. Size manipulation and cropping
   3. Combining multiple images (image addition, subtraction, multiplication etc.)
   4. Applying filter functions to image data (e.g., dilation, gaussian, smoothing, noise reduction)
5. Apply your knowledge of image manipulation to make custom functions for automated analysis of large image databases
6. ~~Utilize processed images as models for simulating real-world processes~~

*(Ecological LOs)*

1. Analyze **species abundance distributions** and estimate **total species richness** using various methods
2. Analyze satellite imagery to…
   1. Assess habitat destruction over time
   2. Assess the effects of climate change
   3. Classify landscape elements
3. ~~Utilized processed satellite images to~~ **~~simulate dispersal~~** ~~using~~ **~~Brownian motion~~** ~~and draw conclusions about population dynamics~~