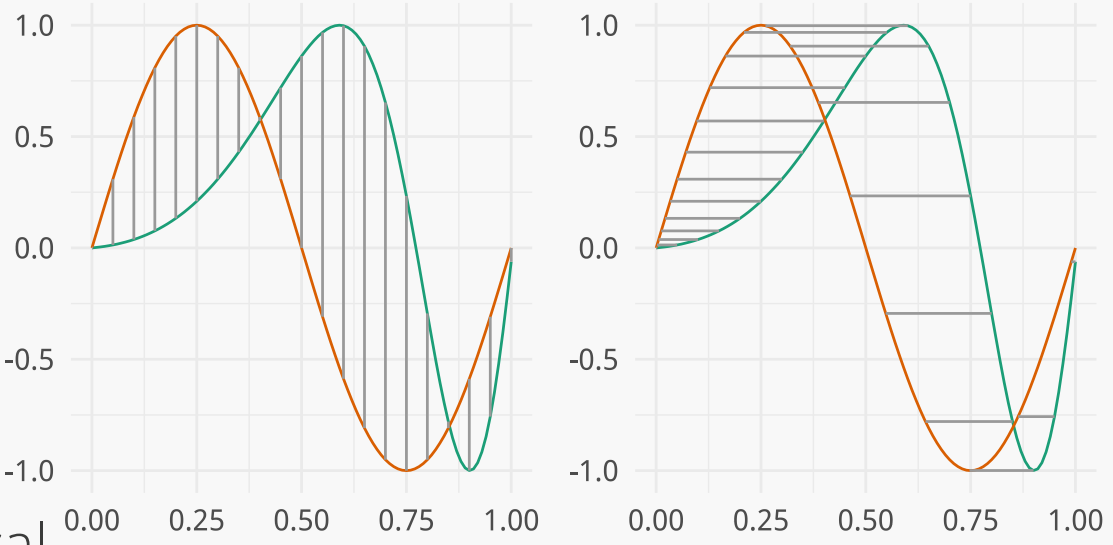
Introduction

- Question: How can we model functions
  - Can we use the functions to **classify** diseases?
  - Can we use them as **predictors** in a regression model?
  - Can we **calibrate** a computer model?
- It is the same goal (question) of any area of statistical study



- One problem occurs when performing these types of analysis is that functional data can contain variability in time (x-direction) and amplitude (y-direction)
- How do we characterize and utilize this variability in the models that are constructed from functional data?

FDA VERSUS MULTIVARIATE STATISTICS

In FDA, one develops the theory on function spaces and not finite vectors, and discretizes the function only at the final step – compute implementation

Ulf Grenander: "Discretize as late as possible" (1924-2016)

Even after discretization, we retain the ability to interpolate resample as needed!