MARQUETTE UNIVERSITY
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*Springer Series in Statistics*

J.O. Ramsay
B.W. Silverman

Functional Data Analysis

Second Edition

Seminar on Functional Data Analysis

Tentative topics :

- ➢ **Dimension Reduction of Data**
    - o Principal Component Analysis (PCA) and Singular Value Decomposition (SVD)
    - o Time Series Modeling and Singular Spectrum Analysis (SSA)
- ➢ **Nonparametric Prediction of Data**
    - o Principal Component Regression (PCR)
    - o SSA Recurrent (R-forecasting) and Vector (V-forecasting) forecasting
- ➢ **R codes for the Aforementioned Topics (applications to real data and source code)**
- ➢ **Basics of functional analysis** required for statistical methodologies that act on **functional data** including:
    - o Hilbert spaces
    - o Orthogonal bases and Gram-Schmidt
    - o Bounded and compact linear operators on a Hilbert space
    - o Matrix representation of a linear operator
- ➢ **Functional Data Analysis (FDA) Dimension Reduction Algorithms**
    - o Functional PCA (FPCA) and Functional SVD (FSVD)
    - o Functional Time Series Modeling and Functional SSA (FSSA)
- ➢ **Nonparametric Prediction of Functional Data**
    - o Functional PCR
    - o Functional R-forecasting and Functional V-forecasting
- ➢ **R codes for the Aforementioned Functional Topics (applications to real data and source code)**
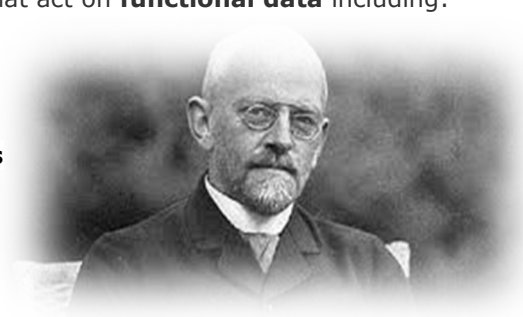
Prerequisites:

- ➢ A course in Programming
- ➢ A course in Statistical Methods
- ➢ A course in Linear Algebra

Credit Options:

- ➢ **Zero and one credit options available**

For more information, email the instructors:

- ➢ Dr. Mehdi Maadooliat (mehdi.maadooliat@marquette.edu) and Jordan Trinka (jordan.trinka@marquette.edu)