STAT665: ADVANCED TIME SERIES ANALYSIS 16:960:665:01

FALL 2023, TUESDAY/THURSDAY 2:00–3:20PM

Course Information

- Instructor: Han Xiao
- Office: Hill Center 451
- Office Hours: Tuesday 3:30-4:30
- Email: `hxiao‘‘atsign’’stat.rutgers.edu` (**I only check this email account regularly!**)
- Texts.
    - *Time Series: Theory and Methods*, by Peter J. Brockwell and Richard A. Davis. Springer, 1991, 2ed. (TSTM)
    - *Asymptotic Theory of Weakly Dependent Random Processes*, by Emmanuel Rio. Springer, 2017.
- Course work: (almost) weekly homework.

Outline

1. Foundations. (4 weeks)
    - Stochastic processes, stationarity, autocovariance fuctions.
    - Spectral representation, spectral decomposition.
    - Linear prediction.
2. ARMA Models. (3 weeks)
    - ARMA processes, linear prediction, estimation.
    - Asymptotic theory for the MLE.
3. Ergodic theorem and CLT for stationary processes. (4 weeks)
    - Strict stationarity, measure preserving transformation, ergodic theorem.
    - CLT for strictly stationary processes, mixing conditions, dependence measures.
4. Analysis of complex time series data. (3 weeks)
    - VAR models.
    - Dynamic factor models.
    - Matrix and tensor-valued time series.

Last updated on August 31, 2023.