Presentation Erin Sprünken 20.11.2020

- Motivation / References State of Art missing
- Types of Bootstrap. (Nonparametric, Wild, Block, Semiparametric...)
- Application: Time series. Clustered Data.
- Datasets: Regression (Residual heteroscedasticity)
- Restructure the presentation to easy writting of paper.
- α, β? Confident Interval, Bands?
- Consuming time in R, C++
- Update reference.

- CValidation: improved strategy to estimate the test error
  Bootstrap: quantifies the uncertainty of model parameters.
- more info: see other page

Wild Bootstrap

- Resampling method designed for regression problems with heteroscedastic error structure
- The name derives from its use of a single residual to estimate the entire conditional distrib. of each response through the use of an auxiliary zero mean, unit variance random multiplier when resampling

Bootstrapping:
- Use random sampling w/ replacement
- Assigns measures of accuracy (bias, variance, CIntervals, CBands) to sample estimates
- Estimate the sampling distrib. of almost any statistic using random sampling methods.
- Constructs also hypothesis tests
- published by Bradley Efron (79), Idea: Sample → Population
  Resample → Sample

- Advantages: Simple, check stability of results, asses the distrib., even when the sample size is insufficient.
- Disadvantages: Although is asympotitally consistent, it does not provide general finite sample guarantees.
  - Time consuming
  - Results depend on representative samples.

- Types of bootstrap schene: Resampling, Bayesian Bootstrap, Smooth Bootstrap, Parametric Bootstrap, Wild Bootstrap., Block Bootstrap. (errors correlated)
- methods: Poisson Bootstrap, Bag of little Bootstrap.
- (?) Relation to other resampling methods: Jackknife Cross Validation (the parameters are estimated in one subsample are applied to another subsample.
- Future: Accuracy of Bootstrap. (~~Monte Carlo~~ Asymptotic refinements is imperfect - Edgeworth expansions!), Useful dim. reductions can be found for estimating Markov transition densities in Markov bootstrap?, length for computing CIntervals or Critical values of tests in applications!