

# Dependent Random Weighting

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# Introduction

We were interested in learning about resampling methods for irregularly spaced time series data. This led us to read the paper

*"The Dependent Random Weighting" (2015) by Srijan Sengupta, Xiaofeng Shao, and Yingchuan Wang.*

The paper:

- Introduces a method that assigns random weights to the irregular time series data
- Weights are created using a dependence structure that mimics that of the observed data

## Irregular Time Series Data

Irregular time series data can occur in two ways.

1. Missing Values: Time series occurs at equally space intervals but not all data points are observed



2. Unequal Intervals: Times when the data are observed are generated from a 1-D point process



## Dependent Random Weighting (the process)

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## Dependent Random Weighting (theorems)

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## Dependent Random Weighting (their simulations)

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## Our Simulations: Overview

We wanted to apply and compare DRW to methods learned in STAT 651. We decided to compare the following situations.

- **Methods:** DRW versus MBB
- **Data:** MA versus AR time series
- **Estimators:** mean versus median
- **Bandwidth:** blocksize versus  $l$ -dependence

Note on irregular data type:

- Paper used unequal time intervals (type 2)
- We used equal time intervals with missing values (type 1)

## Our Simulations: The Setup

In our simulations, we set. . .

- $n = 200$
- $M = 500$
- $K = 1000$



## Our Simulations: Results for Means

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## Our Simulations: Results for Medians

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## Our Simulations: Results for Computing Time

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## Conclusion

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