

Comparison of different semiparametric model-based confidence bands for survival functions

Master's Thesis

**submitted in fulfillment of
the requirements for the degree of
Master of Science
written at Fachhochschule Aachen
Fachbereich Medizintechnik und Technomathematik
under supervision of**

Prof. Gerhard Dikta

Jennifer Groß

Aachen, November, 2017

I hereby declare in lieu of an oath that I have completed the present Master's thesis independently and without illegitimate assistance from third parties.

I have use no other than the specified sources and aids. In case that the thesis is additionally submitted in an electronic format, I declare that the written and electronic versions are fully identical.

The thesis has not been submitted to any examination body in this, or similar, form.

Jennifer Groß

Aachen, Saturday 25th November, 2017

Abstract

Here comes the abstract. This needs to be centered on the page.

Contents

1	Introduction	9
2	Theoretical background	11
3	Simulation Studies	13
4	Results	15
5	Summary	17

1 Introduction

2 Theoretical background

3 Simulation Studies

4 Results

5 Summary

[Efr81] [Dik98] [Dik00] [DKS06] [SZ13] [AS16] [DRH16]

List of Figures

List of Tables

Bibliography

- [AS16] AHMED, NUBYRA and SUNDARRAMAN SUBRAMANIAN: *Semiparametric simultaneous confidence bands for the difference of survival functions*. *Life-time Data Analysis*, 22(4):504–530, Oct 2016.
- [Dik98] DIKTA, GERHARD: *On semiparametric random censorship models*. *Journal of Statistical Planning and Inference*, 66(2):253 – 279, 1998.
- [Dik00] DIKTA, GERHARD: *The strong law under semiparametric random censorship models*. *Journal of Statistical Planning and Inference*, 83(1):1 – 10, 2000.
- [DKS06] DIKTA, GERHARD, MARSEL KVESIC and CHRISTIAN SCHMIDT: *Bootstrap Approximations in Model Checks for Binary Data*. *Journal of the American Statistical Association*, 101:521–530, 2006.
- [DRH16] DIKTA, GERHARD, MARTIN REISSEL and CARSTEN HARLASS: *Semi-parametric survival function estimators deduced from an identifying Volterra type integral equation*. *Journal of Multivariate Analysis*, 147(Supplement C):273 – 284, 2016.
- [Efr81] EFRON, BRADLEY: *Censored Data and the Bootstrap*. *Journal of the American Statistical Association*, 76(374):312–319, 1981.
- [SZ13] SUBRAMANIAN, SUNDARRAMAN and PEIXIN ZHANG: *Model-based confidence bands for survival functions*. *Journal of Statistical Planning and Inference*, 143(7):1166 – 1185, 2013.

Acknowledgements

I want to thank *Prof. Gerhard Dikta* for supporting me on my way to this master's thesis.

Also I want to thank my friends *Olaf Leidinger* and *Diana Kreutz-Kielwein* for their support and motivation effort.

My boyfriend *Justus Schwan* always had my back and stood beside me through this long journey. Thank you for that.