

Preface

With this collections volume, some of the important works of Willem van Zwet are moved to the front layers of modern statistics. We have made a selection based on discussions with Willem, and aiming at a representative sample. The result is a collection of papers that the new generations of statisticians should not be denied. They are here to stay, to enjoy and to form the basis for further research.

We have grouped the papers into six themes. The first three papers give an impression of the broad scope of statistics. One of its core business is as in all mathematics: classification, characterization, and unification. The third paper here discusses M- and Z-estimators, which have their modern face nowadays in non- and semi-parametric models.

The next theme concerns asymptotic theory. We cite Lucien Le Cam ([1]) “*If you need to use asymptotic arguments, don’t forget to let your number of observations tend to infinity*”. Asymptotic statistics is indeed a subtle area involving much more than only pointwise limit theorems. The papers in this volume cover nonparametric tests as well as semi-parametric estimation, putting down the fundamentals for asymptotic efficiency in such models.

A very important, but sometimes notoriously technical topic, is second order approximations. With his co-authors, Willem deals with this topic in an impressingly elegant way. The beauty of concepts in this area is evolving further, for example by the formalization of the distance of distributions to the normal distribution. Within this theme, this volume contains the original contribution of Sergey Bobkov, Gennadiy Chistyakov and Friedrich Götze exposing the limits of near-normality.

Willem was very much intrigued by the bootstrap. It is often used without worrying about its validity, whereas Willem’s intuition said its all round applicability is very questionable. This turned out to be a mind twisting and exciting issue: see the papers in this theme.

There is the modeling, the analysis of the model, and the statistical estimation. In the applications theme, we see all three aspects together. It shows that even though there are many sophisticated probabilistic models around, one still may have to start from scratch when looking at a particular real life problem. This is difficult hard work, but the final result is complete and beautiful.

Although statistics is not often associated with mathematical conjectures, it actually generates many. These are often questions in theoretical probability. The challenge to prove or disprove conjectures deserves its prominent place in statistics, and gives rise to fascinating storytelling.

This volume serves as basic reference for fundamental statistical theory, and at the same time reveals some of its history. We hope the unique mix will show the adventurous aspects of our profession, and that it will be an inspiration to all!

Zürich,
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References

1. L. Le Cam (1990). Maximum likelihood: an introduction. *International Statistical Review/Revue Internationale de Statistique*, **58**, 153–171.

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