Werk

Titel: Pivotal Measures in Statistical Experiments and Sufficiency - S. Yamada.

Autor: Mussmann, D.

Jahr: 1995

PURL: https://resolver.sub.uni-goettingen.de/purl?358794056_0042|log96

Kontakt/Contact

Digizeitschriften e.V.
SUB Göttingen
Platz der Göttinger Sieben 1
37073 Göttingen

info@digizeitschriften.de

S. Yamada: Pivotal Measures in Statistical Experiments and Sufficiency
Springer-Verlag, 1994, VIII/129 pp., DM 68.00/öS 530.40/sFr 68.00

In the context of sufficiency, Neyman factorization theorem, and minimal sufficiency for dominated statistical experiments, Halmos and Savage used a special dominating measure which is a weighted sum of a countable subfamily of probability measures of the experiment. Measures of this kind were called pivotal by Bahadur. They are special cases of pivotal measures defined in these lecture notes for majorized experiments, i.e., experiments for which there is a measure (not necessarily σ-finite) such that the corresponding probability measures have densities. Experiments with discrete probability measures are majorized and in general not dominated. An example is sampling from a finite universe.

The author presents many results related to (pairwise) sufficiency in majorized experiments. Most of them appear for the first time in a book. He himself has contributed a lot in this field. Even for undominated majorized experiments, there are pathologies with respect to minimal sufficiency, Neyman factorization, and pairwise sufficiency. It turned out that there is an important and useful concept which is intermediate between "sufficient" and "pairwise sufficient" called "pairwise sufficient with supports", PSS for short. A Neyman factorization is a criterion for PSS, a subfield including a PSS subfield is itself PSS, and there is a minimal PSS subfield.

Here is a list of some (but not all) of the topics investigated in the individual chapters:

Chapter 1: Basic properties, majorized experiments, weakly dominated or coherent experimets (the majorizing measure is localizable), the support of a probability measure with respect to the family of probability measures, maximal decompositions, examples.

Chapter 2: Smallest PSS subfield (generated by likelihood ratios and supports), existence of pivotal measures for proving a general Neyman factorization theorem, corresponding sharper results in the weakly dominated case.

Chapter 3: The detailed structure of pairwise sufficient subfields and PSS subfields, making use of maximal decompositions (partition of the sample space in the case of discrete experiments).

Chapter 4: The Rao-Blackwell theorem and UMVU estimation for the undominated case, characterization of PSS using this framework, Bahadur's converse of the Lehmann-Scheffé theorem for majorized experiments.

Chapter 5: Construction of a generalized common conditional probability for a PSS subfield using Le Cam's L- and M-spaces for experiments (the pivotal measure is of essential importance here), Rao-Blackwell and Lehmann-Scheffé type theorems for PSS subfields.

Chapter 6: The close relation between pivotal measures and maximal orthogonal systems of the minimal L-space of an experiment in the sense of Le Cam.