Kolloquium „Statistische Methoden in der empirischen Forschung"

Wann: 12. November 2024, 17:00 – 18:30 Uhr

Wo: Campus Charité Mitte | Raum 02.002 | Sauerbruchweg 3, 10117 Berlin

Online-Übertragung: der Link wird auf der Website zur Verfügung gestellt

Vortragssprache: Englisch

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Additive Regression Models for Density responses with an Application to Gender Economics
We present additive regression models to model densities given scalar covariates. To acknowledge that densities are nonnegative and integrate to one, we formulate our models for densities within so-called Bayes Hilbert spaces. This enables us to not only consider continuous densities, but also, e.g., discrete densities (compositional data) or mixed densities. Mixed densities occur in our application motivated by research on gender identity norms and the distribution of the woman's share in a couple's total labor income, as the woman's income share is a continuous variable having discrete point masses at zero and one for single-earner couples. We show how to handle the challenging case of mixed densities using a decomposition. We discuss interpretation of effect functions in our model via odds-ratios. We consider two cases: First, where densities are observed and are directly used as responses. Second, when only individual scalar realizations of the conditional distributions are observed, but not the whole conditional densities, we use our additive regression approach to model the conditional density given covariates. We show approximate equivalence of the resulting penalized likelihood to a certain penalized Poisson likelihood, facilitating estimation via additive Poisson regression models. We apply our framework to a motivating gender economic data set from the German Socio-Economic Panel Study (SOEP) to analyze the distribution of the woman's share in a couple's total labor income, given year, place of residence and age of the youngest child. Results show a more symmetric distribution in East German than in West German couples after German reunification and a smaller child penalty comparing couples with and without minor children. These West-East differences become smaller, but are persistent over time.