THE UNIVERSITY OF CHICAGO | DEPARTMENT OF STATISTICS

Master's Thesis Presentation

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"Empirical Bayes learning from selectively reported confidence intervals"

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Abstract

We develop a statistical framework for empirical Bayes learning from selectively reported confidence intervals, applied here to provide context for interpreting results published in MEDLINE abstracts. A collection of 326,060 z-scores from MEDLINE abstracts (2000–2018) provides context for interpreting individual studies; we formalize this as an empirical Bayes task complicated by selection bias. We address selection bias through a selective tilting approach that extends empirical Bayes confidence intervals to truncated sampling mechanisms. Our framework provides coverage guarantees for functionals including posterior estimands describing idealized replications and the symmetrized posterior mean, which we justify decision-theoretically as optimal among sign-equivariant (odd) estimators.
