

## **A NEW APPROACH TO ROBUST PARAMETER ESTIMATION AGAINST HEAVY CONTAMINATION**

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In the conventional approach to robust parameter estimation, the influence function and breakdown point are often used as indexes of robustness in parameter estimation. However, they never guarantee that the bias caused by outliers is small in the case where the rate of outliers is not small, in other words, in the case of heavy contamination. This paper focuses on a certain cross entropy and divergence, which enable us to reasonably deal with the case of heavy contamination. We see that the bias caused by outliers can become sufficiently small even in the case of heavy contamination. The proposed method can be shown to be a kind of projection from the viewpoint of a Pythagorean relation, which is why it works well. In addition, it is proved that the method of parameter estimation with a sufficiently small bias even in the case of heavy contamination is essentially unique under some conditions.