

Loss-sensitive Training of Probabilistic Conditional Random Fields

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We consider the problem of training probabilistic conditional random fields (CRFs) in the context of a task where performance is measured using a specific loss function. While maximum likelihood is the most common approach to training CRFs, it ignores the inherent structure of the task's loss function. We describe alternatives to maximum likelihood which take that loss into account. These include a novel adaptation of a loss upper bound from the structured SVMs literature to the CRF context, as well as a new loss-inspired KL divergence objective which relies on the probabilistic nature of CRFs. These loss-sensitive objectives are compared to maximum likelihood using ranking as a benchmark task. This comparison confirms the importance of incorporating loss information in the probabilistic training of CRFs, with the loss-inspired KL outperforming all other objectives.

Subjects: **Machine Learning (stat.ML)**; Artificial Intelligence (cs.AI)

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