

## **NAtural LOgic meets MACHine Learning (NALOMA) 2021**

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**Title:** Bayesian Classification and Inference in a Probabilistic Type Theory with Records

**Abstract:** We propose a probabilistic account of semantic inference and classification formulated in terms of probabilistic type theory with records, building on Cooper et al. (2014, 2015). We suggest probabilistic type theoretic formulations of Naive Bayes Classifiers and Bayesian Networks. A central element of these constructions is a type-theoretic version of a random variable. We illustrate this account with a simple language game combining probabilistic classification of perceptual input with probabilistic (semantic) inference.