

HYBRID RANDOM FIELDS

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Hybrid Random Fields [1] is a class of graphical probabilistic models and it combines Bayesian Networks and Markov Random Fields models. Due to certain assumptions and properties [1] of Hybrid Random Fields, it can simplify the calculation of joint distribution for a certain set of random variables and conditional probability densities for each of the random variables.

In the scope of this project, Hybrid Random Fields is adjusted to classification and regression tasks, which require the prediction of a certain random variable value, and is compared to classical machine learning algorithms by performance. As this class of models has different joint density estimation processes [2] [3], different estimators of $\mathbb{E}[Y|X]$ were developed, as finding solution of (1) for continuous data case can be quite complex.

$$\mathbb{E}[Y|X = x] = \int_{-\infty}^{\infty} yf(y|X = x) dy \quad (1)$$

After the development of these estimators, they are compared with classical machine learning approaches to these tasks such as Logistic Regression, Linear Regression, Random Forrest, Naive Bayes, K-Nearest Neighbors and Support Vector Machines with appropriate metrics.

ЛІТЕРАТУРА

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