

Intelligent Systems: Reasoning and Recognition

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Ensimag 2
Exercise 2

Winter Semester 2018-2019
15 February 2019

Non-Parametric Models for Conditional Probability

Describe whether or not it is possible to use the specified technique to construct a conditional probability model for each of the following problems. If it IS possible, give the formulae for $P(\omega_k | \vec{X})$. If it is not possible, explain why.

- 1) You have a training set composed of grades from 6 classes for a population of 100 students from 20 countries. Can you use a K-nearest neighbor classifier to determine most likely nationality for an unknown student from their grades?
- 2) You have a training set composed of the weight (kg), height (cm), age (y) and gender for a population of 100 people. Can you use a Kernel density estimator to determine most likely gender for an unknown person from their weight (kg), height (cm) and age (y)?
- 3) You have a training set composed of the eye-color and nationality for a population of 1000 people. Can you use a ratio of histograms to determine most likely nationality of an unknown person from their eye-color ?