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Session : Classification

Nonparametric bayesian modelling of co-exposures to various pesticides to determine cocktails

par **Amélie Crepet**

This work introduces a specific application of Bayesian nonparametric models in food risk analysis framework. The goal is to determine mixture of pesticides residues which are simultaneously present in the diet, to give directions for future toxicological experiments for studying possible combined effects of those mixtures. Namely, the distribution of the exposures to a large number P of pesticides is assessed from the available consumption data and contamination analyses. We propose to model the co-exposures to the P pesticides by a Dirichlet process mixture based on a multivariate Gaussian kernel so as to determine clusters of individuals with similar co-exposure patterns. The posterior distributions and the optimal partition are computed through a Gibbs sampler based on stick-breaking priors. To reduce computational time due to the high dimensional data, a random block sampling is used. Other nonparametric Bayesian models such as models based on Indian Buffet process will be developed to propose a simultaneously classification of the individuals and the pesticides in groups.

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