

# **Modelling preference with hyperplane arrangement**

Shizuo KAJI (Kyushu University)

## Abstract

A person's preference on a set of options, such as political parties and film genres, can be represented by a (partial) order on the set. Modelling preference data collected from many individuals with various tastes is a subject of preference learning. There are two major approaches to modelling preference data; based on the distance on orders and based on a utility function defined over the set of options. These approaches lack flexibility or are biased since too much structure is forced on the preference data to be modelled by the mathematical structure that the models utilise. We propose a novel model for preference data based on hyperplane arrangement, which has been studied in topology and algebraic combinatorics. The topological and combinatorial structure of hyperplane arrangement provides a suitable balance of flexibility and regularisation. This is joint work with T. Abe, A. Horiguchi, and Y. Watanabe.