From Coupling to Copula: Examples from Modeling Multisensory Processes

Hans Colonius

Coupling means the joint construction of two or more random variables (or processes) usually in order to deduce properties of the individual variables or gain insight into distributional similarities or relations among them.’ [Thorisson, H. (2000) Coupling, stationarity, and regeneration, Springer-Verlag]. ‘Copulas are functions that join multivariate distribution functions to their one-dimensional margins.’ [Nelsen, R.B. (1999) An introduction to copulas, Springer-Verlag]. Both theories play an increasingly important role in probability and statistics. In this talk, I illustrate how some elementary concepts from both theories can be used to solve problems in developing and testing stochastic models of multisensory interaction, i.e., effects that occur when stimuli from more than a single sensory modality are to be processed by the perceiver.