Title: Functional interaction model

Abstract:
Functional regression with functional predictors is now a well-studied area in functional data analysis. Existing methods, however, are limited to an additive assumption of the covariates effect, and ignore interactions between the functional covariates. We introduce a functional interaction modeling and inferential framework where the response depends on functional covariates and, in addition, on the interaction between them. The methods rely on basis function expansions of the coefficient functions, and on the mixed effects representation of the penalized regression. Methodological developments are general, but were inspired by and applied to a Diffusion Tensor Imaging (DTI) brain tractography dataset.