



Analyzing human mortality dynamics by marginal FPCA

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Marginal FPCA is a simple and interpretable model for functional data analysis for situations where the observations at each location are functional rather than scalar. This approach is based on a tensor product representation of the function-valued process and provides optimal marginal representations in a well-defined sense. We analyze the dynamics of mortality profile functions (in age groups of 5 years) of 200 countries for the period 1950-2010 (with available data every 5 year). Marginal FPCA leads to much more straightforward analysis of the dynamics of the mortality process compared to standard FPCA of bivariate functions.

Keywords: Demography; Functional data analysis; Functional principal component analysis; Karhunen-Loève expansion.