Prediction of missing functional data with memory

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We consider optimal prediction of functional observations $X^i = (X^i_t)_{t \in [0,1]}, i = 1, \ldots, n$ that are realisations of some Gaussian subordinated process. We assume that parts of the paths are unobservable, and our aim is to fill in the missing information as accurately as possible. One natural approach is to predict some missing value $X^k_s$ by using the information provided by $X^i_t, i \neq k$ of those functions $X^i$ for which $X^i_s$ is observed. However, under memory the unobserved $X^k_s$ relies heavily on that particular functional observation $X^k$ directly, and thus applying other observations $X^i$ may be misleading, even if they are drawn from the same stochastic process. In this talk we present a novel approach for accurate prediction of missing information $X^k_s$ that is based on applying combined information provided by the observed part of the path $X^k$ and the observed values $X^i_s, i \neq k$. 