Gaussian Processes for Time Series

Topic for Honours Project (Birgit Erni)

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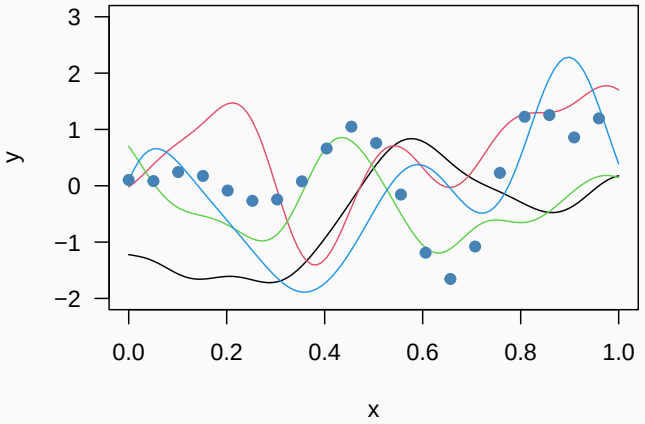
Gaussian Process

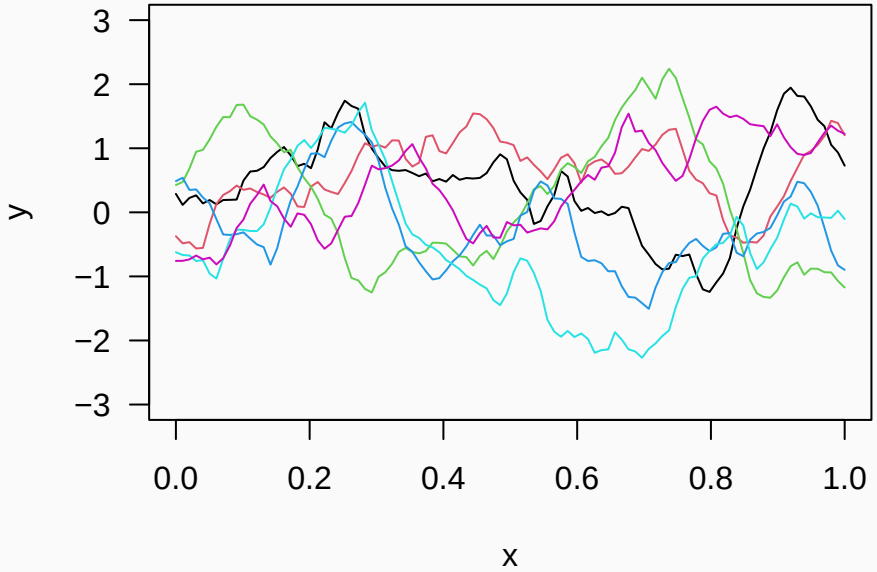
Realizations of a Gaussian Process:



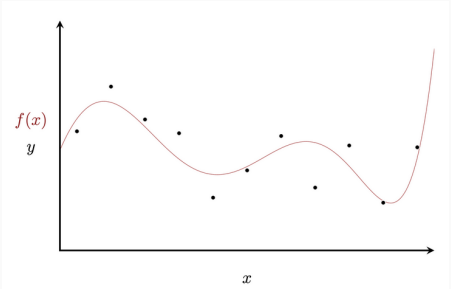
$$\mathbf{Y} \sim MVN(\mathbf{0}, K(\mathbf{x}, \mathbf{x}))$$

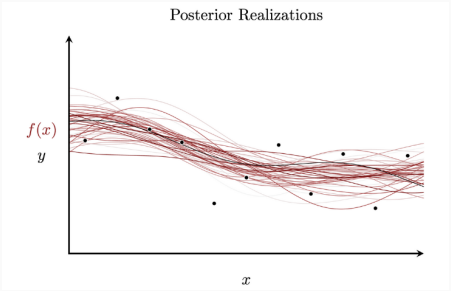
$K(\mathbf{x}, \mathbf{x})$: Covariance function – how correlation between points changes with distance

Other Covariance Functions



Gaussian Process for Time Series





- nonlinear trend / change over time
- time = x
- simulate, fit to data, predict
- compare to other time series models
- Bayesian

Michael Betancourt: Robust Gaussian Process Modeling: https://betanalpha.github.io/assets/case_studies/gaussian_processes.html