



Gaussian Processes for Nonlinear Signal Processing

[Fernando Pérez-Cruz](#), [Steven Van Vaerenbergh](#), [Juan José Murillo-Fuentes](#), [Miguel Lázaro-Gredilla](#), [Ignacio Santamaria](#)

(Submitted on 12 Mar 2013)

Gaussian processes (GPs) are versatile tools that have been successfully employed to solve nonlinear estimation problems in machine learning, but that are rarely used in signal processing. In this tutorial, we present GPs for regression as a natural nonlinear extension to optimal Wiener filtering. After establishing their basic formulation, we discuss several important aspects and extensions, including recursive and adaptive algorithms for dealing with non-stationarity, low-complexity solutions, non-Gaussian noise models and classification scenarios. Furthermore, we provide a selection of relevant applications to wireless digital communications.

Comments: IEEE Signal Processing Magazine, 2013 (To Appear)

Subjects: **Learning (cs.LG)**; Information Theory (cs.IT); Machine Learning (stat.ML)

Cite as: [arXiv:1303.2823 \[cs.LG\]](#)
(or [arXiv:1303.2823v1 \[cs.LG\]](#) for this version)

Submission history

From: Steven Van Vaerenbergh [[view email](#)]

[v1] Tue, 12 Mar 2013 10:16:29 GMT (1298kb,D)

[Which authors of this paper are endorsers?](#)

Link back to: [arXiv](#), [form interface](#), [contact](#).

Download:

- [PDF](#)
- [Other formats](#)

Current browse context:

cs.LG

[< prev](#) | [next >](#)

[new](#) | [recent](#) | [1303](#)

Change to browse by:

cs

[cs.IT](#)

[math](#)

[stat](#)

[stat.ML](#)

References & Citations

- [NASA ADS](#)

DBLP - CS Bibliography

[listing](#) | [bibtex](#)

[Fernando Pérez-Cruz](#)

[Steven Van Vaerenbergh](#)

[Juan José Murillo-Fuentes](#)

[Miguel Lázaro-Gredilla](#)

[Ignacio Santamaria](#)

Bookmark (what is this?)

