

Home

Online Library HESS

- Recent Final Revised Papers
- [Volumes and Issues](#)
- Special Issues
- Library Search
- Title and Author Search

Online Library HESSD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper

Impact
Factor
2.270

ISI
indexed

ARCHIVED IN



PORTICO

- Volumes and Issues
- Contents of Issue 2
- Special Issue

Hydrol. Earth Syst. Sci., 5, 215-223, 2001
www.hydrol-earth-syst-sci.net/5/215/2001/

© Author(s) 2001. This work is licensed
under a Creative Commons License.

Influence of parameter estimation uncertainty in Kriging: Part 1 - Theoretical Development

E. Todini

Department of Earth and Geo-Environmental Sciences, University of Bologna, Italy
Email: todini@geomin.unibo.it

Abstract. This paper deals with a theoretical approach to assessing the effects of parameter estimation uncertainty both on Kriging estimates and on their estimated error variance. Although a comprehensive treatment of parameter estimation uncertainty is covered by full Bayesian Kriging at the cost of extensive numerical integration, the proposed approach has a wide field of application, given its relative simplicity. The approach is based upon a truncated Taylor expansion approximation and, within the limits of the proposed approximation, the conventional Kriging estimates are shown to be biased for all variograms, the bias depending upon the second order derivatives with respect to the parameters times the variance-covariance matrix of the parameter estimates. A new Maximum Likelihood (ML) estimator for semi-variogram parameters in ordinary Kriging, based upon the assumption of a multi-normal distribution of the Kriging cross-validation errors, is introduced as a mean for the estimation of the parameter variance-covariance matrix.

Keywords: Kriging, maximum likelihood, parameter estimation, uncertainty

Final Revised Paper (PDF, 112 KB)

Citation: Todini, E.: Influence of parameter estimation uncertainty in Kriging: Part 1 - Theoretical Development, Hydrol. Earth Syst. Sci., 5, 215-223, 2001. [Bibtex](#) [EndNote](#) [Reference Manager](#)

Copernicus Publications
The Innovative Open Access Publisher

Search HESS

Library Search

Author Search

News

- New Service Charges
- Financial Support for Authors
- ISI Impact Factor: 2.270

Recent Papers

01 | HESSD, 23 Mar 2009:
Reducing the hydrological connectivity of gully systems through vegetation restoration: combined field experiment and numerical modelling approach

02 | HESSD, 20 Mar 2009:
Linking hydrogeology and ecosystem services: differential controls of surface field saturated hydraulic conductivity in a volcanic setting in central Mexico

03 | HESSD, 20 Mar 2009:
Hydrological model