Brno University of Technology Faculty of Information Technology	**Report No.: AWBDS 01.2017**

Report type: **Final research report for project**

Big Data Smoothing

Big Data Smoothing for Industrial Applications

Annotation:

The summary report introduces the research on Big Data Smoothing for Industrial Applications which utilize a broad spectrum of measured or calculated multivariate data. Customized approaches applicable to Big Data Smoothing have been investigated with an aim to take a full benefit of multivariate data geometrical properties in their respective n-dimensional spaces.

Pages:	5	**Copy Ref. No.:**
Appendices:	0	

Original Issue: **29.12.2017**

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The sophisticated state-of-the-art digital systems which are implemented in a variety of today's industrial applications benefit from a broad spectrum of measured or calculated multivariate data. The computational expense associated with processing of large scale n-dimensional structures is in most cases attributed not only to their shear size, but also to their smoothness properties. Customized approaches applicable to Big Data Smoothing have been investigated with an aim to take a full benefit of multivariate data geometrical properties in their respective n-dimensional spaces.

The multivariate data are challenging to smooth in a way, which preserves desired accuracy over n-dimensional spaces. Smoothing is defined as creating a functional representations that captures the significant properties of data, while typically canceling out the noise. The number of points considered in the function definition is therefore usually reduced, which contributes to a smoother signal. Smoothing is considered a prerequisite for computationally robust and flexible tasks.

The extent of n-dimensional data smoothing is controlled via associated smoothing parameter. The results of the smoothing procedure are smoothed multivariate functional values. Generally, the smoothing function can be made available for later use upon request.

Following tasks have been performed for the Big Data Smoothing:

#1   Multidimensional Big Data Preparation.
#2   Multidimensional Big Data Smoothing.
#3   Document of Multidimensional Data Smoothing process and algorithm definition.
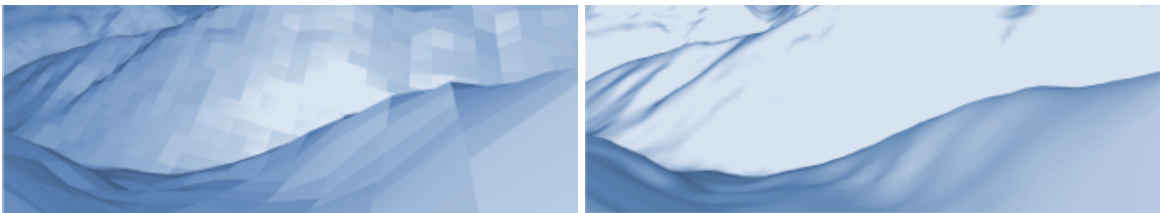

Figure 1 Original data set vs. smoothed values

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Hereby it is confirmed that on the 26th October 2017 the Supplier provided to the Buyer and the Buyer received and fully accepted following items:

Item	Description	Delivery Date
#1	Multidimensional Big Data Preparation	26/OCT/2017

Provided by: Accepted by:

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Hereby it is confirmed that on the 30th November 2017 the Supplier provided to the Buyer and the Buyer received and fully accepted following items:

Item	Description	Delivery Date
#2	Multidimensional Big Data Smoothing	30/NOV/2017

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Hereby it is confirmed that on the 13th December 2017 the Supplier provided to the Buyer and the Buyer received and fully accepted following items:

Item	Description	Delivery Date
#3	Document on Multidimensional Data Smoothing process and algorithm definition	13/DEC/2017

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