

Author's Accepted Manuscript

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Pablo Soto Quiros, Anatoli Torokhti



PII: S0165-1684(16)30252-3
DOI: <http://dx.doi.org/10.1016/j.sigpro.2016.09.020>
Reference: SIGPRO6275

To appear in: *Signal Processing*

Received date: 8 March 2016
Revised date: 9 August 2016
Accepted date: 30 September 2016

Cite this article as: Pablo Soto Quiros and Anatoli Torokhti, Optimal transforms of random vectors: The case of successive optimizations, *Signal Processing* <http://dx.doi.org/10.1016/j.sigpro.2016.09.020>

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Optimal Transforms of Random Vectors: the Case of Successive Optimizations

Pablo Soto Quiros^{a,b}, Anatoli Torokhti^{a,*}

^a*School of Information Technology and Mathematical Sciences, University of South Australia, SA 5095, Australia*

^b*Instituto Tecnológico de Costa Rica, Apdo. 159-7050, Cartago, Costa Rica*

Abstract

We propose and justify new transforms of random vectors which provide, under a certain condition, better associated accuracy than that of the optimal transforms, the generic Karhunen-Loève transform and the transform considered by Brillinger. It is achieved by special structures of the proposed transforms which contain more parameters to optimize compared to the known transforms.

Keywords: Karhunen-Loève transform, Principal Component Analysis, Least squares linear estimate, Rank-reduced matrix approximation, Singular value decomposition.

1. Introduction

1.1. Motivation

Techniques associated with data compression are used in a number of areas of signal processing such as, to name a few, robust estimation of principal and minor components

*Corresponding author

Email addresses: juan.soto-quiros@mymail.unisa.edu.au (Pablo Soto Quiros),
anatoli.torokhti@unisa.edu.au (Anatoli Torokhti)

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