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OPTIMAL SUBSPACES AND CONSTRAINED PRINCIPAL COMPONENT ANALYSIS*

JEAN-DANIEL ROLLE†

Abstract. The main result of this article allows formulas of analytic geometry to be elegantly unified, by readily providing parametric as well as cartesian systems of equations. These systems characterize affine subspaces in $\mathbb{R}^p$ passing through specified affine subspaces of lower dimension. The problem solved is closely related to constrained principal component analysis. A few interesting applications are pointed out, notably a measure of the relative loss of optimality due to the constraints. The results pave the way for further research.

Key words. Optimal subspace problem, Constrained principal component analysis, Affine subspace.

AMS subject classifications. 15A03.

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†Haute Ecole de Gestion, University of Applied Sciences, Fribourg, Switzerland (Jean-Daniel.Rolle@eif.ch, rolle@freesurf.ch). Supported by a generous grant from the Haute Ecole de Gestion, Fribourg.