

4th International Conference on

BIG DATA ANALYSIS AND DATA MINING

September 07-08, 2017 | Paris, France

Multi-objective optimization via visualization

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This paper presents a very simple and intuitive multi-objective optimization method that makes use of interactive visualization techniques. This approach stands mid-way between the brush and link technique, a visual method used in operational research for exploratory analysis of multidimensional data sets and interactive multi-criteria decision methods that use the concept of reference point. Multiple views of the potential solutions on scatterplots allow the user to directly search acceptable solutions in bi-objective spaces whereas a Venn diagram displays information about the relative scarcity of potential acceptable solutions under distinct criteria. Those very intuitive data visualization techniques allow for comprehensive interpretation and permit to communicate the results efficiently. More generally the combination of information visualization with data mining allows the user to specify what he is looking for, yields easily reportable results and respects human responsibility. An application to the visual steering of genetic algorithms in a multi-criteria strategic asset allocation optimization problem is presented.

Biography

Nicola Wesner has completed his PhD in Economics at Paris X Nanterre University in 2001 and he is an Associate Actuary since 2011. He is the Head of the Pension department at Mazars Actuariat, an audit and advisory firm. He has published many papers in reputed journals and has specialized periodicals on various subject such as econometrics, quantitative finance, insurance and pension, and data mining.

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