

Title: Hybridized Evolutionary Optimization with Game Strategies for Multi-disciplinary Design Applied to Aeronautics

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ABSTRACT

This VKI LS lecture [1] describes in two parts (Part1 and Part 2) recent developments of evolutionary multi objective and multidisciplinary optimization (MO & MDO) techniques with their advantages and drawbacks compared to traditional deterministic optimizers. In Part 1, the importance of Game Strategies (GS), such as Pareto or Nash games as speed up companion of Multi objective GAs Optimizers is discussed on simple mathematical functions and a simple Bump active device test case optimisation problem in the computer using a friendly design framework.

Then in a second part, real life design optimization problems dealing with UAVs systems (Mission Path Planning) or Civil Aircraft (High Lift configuration , Morphing Design) and using hybridized EAs with Game Strategies are discussed offering to academic/industrial designers new compromised solutions useful to digital aircraft design and manufacturing.

These numerical results illustrate the potentiality of fast advanced evolutionary optimizers in multidisciplinary design [2].

REFERENCE

- [1] T. Verstraete and J. Périaux, *Optimization Methods & Tools For Multidisciplinary Design In Aeronautics and Turbomachinery*, VKI notes , Rhode Saint Genese, April 7-11, 2014
- [2] J. Périaux, F. Gonzalez, Donseop Chris Lee, *Evolutionary Optimization and Games Strategies For Advanced Design : Applications to Aeronautics* , Springer , to appear 2014