



I.P. HERCULES Task 11.2: Intelligent Engine

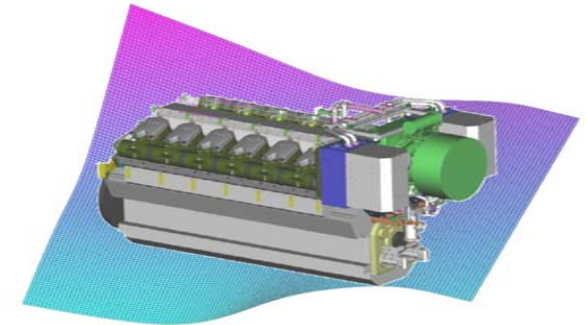


Augsburg
MAN Diesel Copenhagen



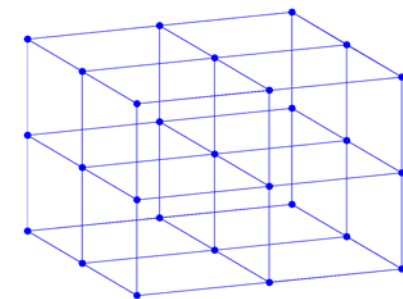
KRISTEN NAVIGATION INC.

Final Results

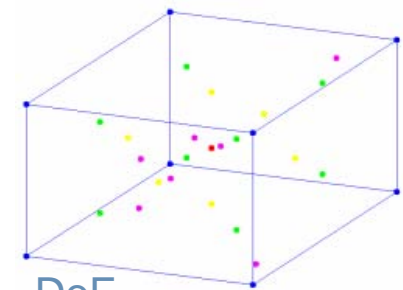


Intelligent engine control

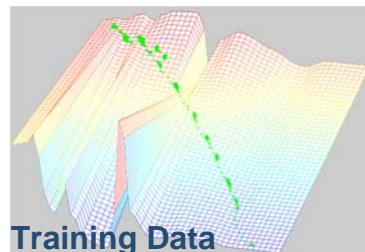
- Development of a complete mechanism to optimize engine operation (offline)
→ *operating point optimization* feasible as well as *operating range optimization*
- Identification of variables, interactions & objective functions to improve the Diesel engine
- Evaluation, Integration & Application of *Design of Experiments (DoE)* to minimize the effort of testbed activity & to maximize the amount of resulting information.
- Integration of *modelling techniques* such as *neural networks* & *polynomials*
- Development, Evaluation, Application & Integration of *optimization algorithms* to test functions as well as to characteristic maps of a Diesel engine
- Multi-dimensional & multi-criterial relationships are now manageable
- The Autotuning system is working well & will be installed onboard a vessel in service
- A profound basis for the HERCULES-beta project was gained to start from



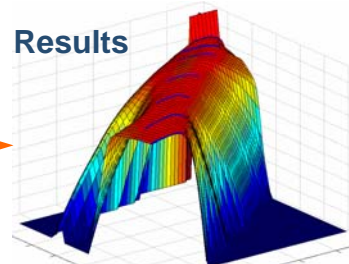
grid measurement



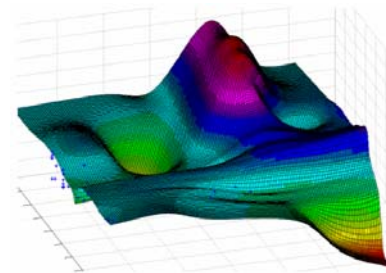
DoE



Training Data



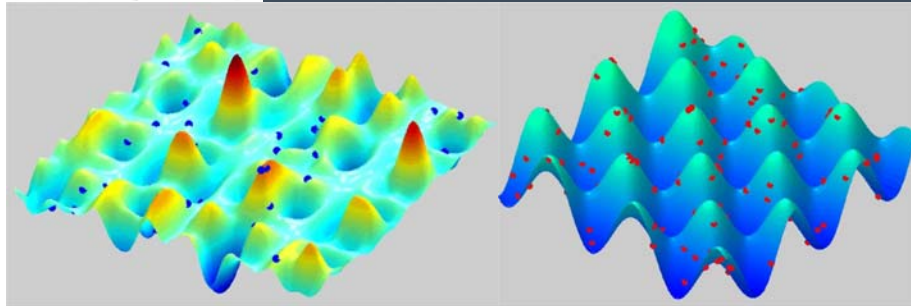
Results



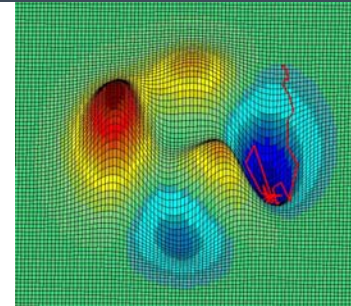
Characteristic Map



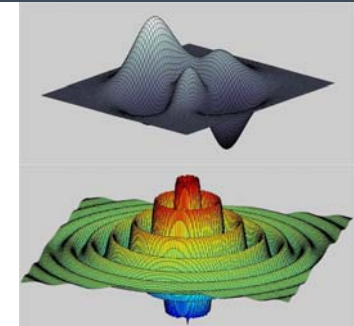
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Particle Swarm Optimization (PSO) on testfunctions



Tracing the algorithms



Testfunctions

