

Stochastic optimisation of GeantV code by use of genetic algorithms

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Highlights of talk

INTRODUCTION

STOCHASTIC OPTIMISATION

MVA

CLUSTERING

GEANTV

RESULTS

FUTURE PLANS

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- Introduction to optimization of computing performance of GeantV simulations as multi-objective optimization problem;
- Usage of genetic algorithms (GA) and evolution strategies (ES) as example of stochastic algorithms for optimization purposes of GeantV computing performance;
- Unsupervised machine learning as one of important steps for the processing performance measurements of GeantV simulations.
- Principle Component Analysis (PCA) as one of the methods introduced as genetic operator for acceleration of convergence rate of genetic algorithms and its modifications for highly constrained data;
- Ideas of using spectral clustering for handling groups of machines in heterogeneous clusters for organization of HPC layer of GeantV;
- GeantV approaches for handling embarrassingly parallel simulations;
- Preliminary results and future plans.