GESOP

Graphical Environment for Simulation and Optimisation

Overview

GESOP is an environment for simulation and optimisation of user coded models. GESOP simplifies the specification and processing of optimisation problems as much as possible. The user is able to programme his model and optimisation specific aspects with basic programming knowledge. Several integrators and optimisation techniques support the user in his work process.

Programming Interface

A user coded dynamic link library is linked to GESOP. Coding examples are provided in Ada95, C/C++, Fortran and MATLAB®.

Main Interface Routines

- Right hand side
- Boundary and path constraints
- Cost functions
- Control law interface
- Problem description interface

Optimisation Formulation

Methods

- Direct collocation and multiple-shooting with CAMTOS and SOS
- Parameter optimisation
- Nonlinear identification with SOS/SOPE

NLP Solvers

- WORHP: newest sparse NLP solver for several 100,000 parameters used by CAMTOS and developed by SFZ Optimierung, Steuerung und Regelung. ESA funded with Astos Solutions as prime contractor.
- SNOPT®: sparse NLP solver from Stanford University
- SLLSQP: dense NLP solver by D. Kraft
- SNLPMN and SBRNLP: sparse NLP solvers developed by J. T. Betts
- MIDACO: random search and mixed integer solver based on ANT colony algorithms developed by M. Schlueter.
- CGA: classical genetic algorithms developed by D. Fischer and Astos Solutions

Grids

- State grid
- Individual control grids
- Path constraint grid

Output and Analysis

- Output functions at user defined step size
- Plotting and reporting function
- Optimisation process monitor

User interface

- All parameters, like grid definition, accessible either via GUI or via XML file
- Batch mode to automatize processes
- Command line interface

License Policy

- Perpetual node locked or floating license, 20 hours support and software updates for one year, 2-day initial training in Stuttgart, Germany.
- An annual maintenance with software updates and 20 hours of support is recommended.

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