

Overview

SOS is a general purpose software tool for solving optimisation problems developed by John T. Betts, Applied Mathematical Analysis, LLC. SOS is the successor of SOCS. Typical applications are optimal control for trajectories, chemical process control, and machine tool path definition, as well as parameter estimation and data fitting.

Optimisation Features

- Solves optimal control problems with 500,000 parameters and 500,000 constraints
- NLP-solvers SNLPMN (SQP) and SBRNLP (sparse primal-dual interior point algorithm)
- Automatic mesh refinement
- Alternate Discretizations
- Automatic sparsity determination
- Sparsity computations
- Broad set of discretization methods
- Extensive debugging utilities

Non-Linear Parameter Estimation

Permits solution of "inverse problems" involving measurement data at discrete time points minimizing the elements of a residual vector.

Diverse Applicability

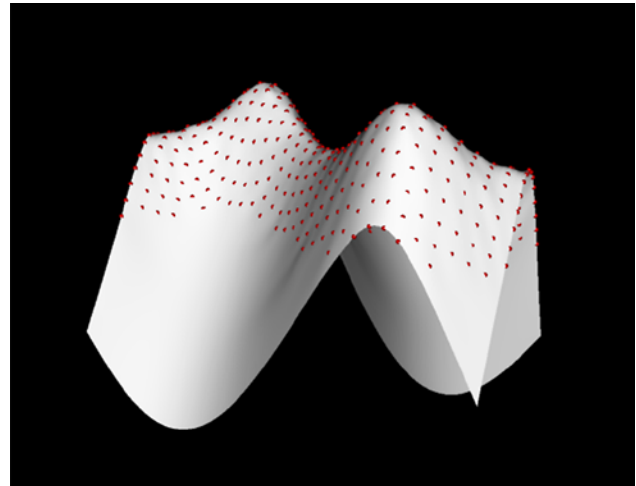
- SOS has been successfully applied to problems in
- Aerospace trajectory design.
- Robot and machine tool path design.
- Chemical process control.
- Distributed parameter control of partial differential equations (PDEs).
- Chaotic differential equations.
- Delay differential equations.

Data Fitting

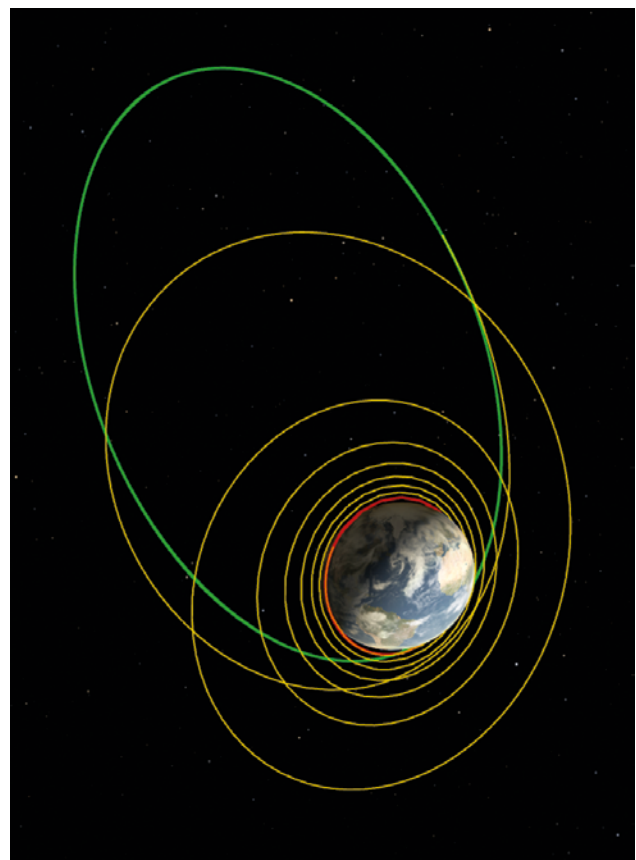
Univariate and multivariate data fit with least squares approximation, monotonic approximation, gridded data interpolation, and spline approximation. Applications include modelling thrust data, ephemeris data, and aerodynamic performance data such as lift and drag coefficients.

Availability

Stand-Alone with programming interface
Embedded in GESOP/ASTOS



Interpolation of multivariate data



Low thrust orbit transfer