Docket #: S16-270

DNOPT (dense nonlinear optimizer)

DNOPT (dense nonlinear optimizer) is Fortran 77 software developed by Prof Philip Gill and Elizabeth Wong (UC San Diego) and Prof Michael Saunders (Stanford). DNOPT is a robust solver for moderate-sized constrained optimization problems involving smooth functions with known gradients and perhaps Hessians. It is economical in its use of function and gradient values and is therefore effective for applications whose function or gradient evaluations are expensive.

Applications

- Trajectory optimization for air and space vehicles
- Shape optimization for aircraft
- Control optimization for autonomous vehicles
- Numerous areas of engineering, economics, biology, physics, etc.

Advantages

- Analogous to NPSOL, with improved handling of infeasible constraints analogous to our large-scale optimizer SNOPT.
- User can provide second derivatives of the problem objective or constraint functions to improve the rate of convergence.
- DNOPT embodies the first SQP method that uses a convexification technique to treat problems for which second derivatives are available.

Innovators

- Philip Gill
- Elizabeth Wong
- Michael Saunders

Licensing Contact

Evan Elder

Associate Director, Licensing and Strategic Alliances, Physica

Email