Optimization-Based Modeling and Design of Electronic Circuits
Exercise on Space Mapping (Optional)

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Implement the Broyden-based Input Space Mapping

Starting from your implementation of the Broyden method to solve systems of non-linear equations, adapt your code such that it implements the so called "Aggressive Space Mapping" algorithm, or Broyden-based input space mapping algorithm.

To perform parameter extraction at each iteration, use the Nelder-Mead method available in Matlab (or any other classical optimization method).

When the algorithm is ended, report:

   a) the space-mapped solution found
   b) the total number of fine model evaluations
   c) the number of coarse model evaluations at each iteration
   d) the final values of the linear mapping (B and c)
   e) the final value of the system of nonlinear equations norm, $\|f\|$
   f) the activated criterion by which the algorithm ended.

Test your implementation with the synthetic problems contained in the following folders:

   1) prob_SM_ZTranTL_1sec: Capacitively-Loaded 2:1 One-Section Impedance Transformer (1D problem)
   2) prob_SM_ZtranTL_2sec: Capacitively-Loaded 10:1 Two-Section Impedance Transformer – Chebyshev (2D problem)
   3) prob_SM_RLC: RLC Parallel Lumped Resonator – three levels of difficulty (3D problem)