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SobolGSA -
general purpose GUI driven tool for global sensitivity analysis, machine learning and optimization

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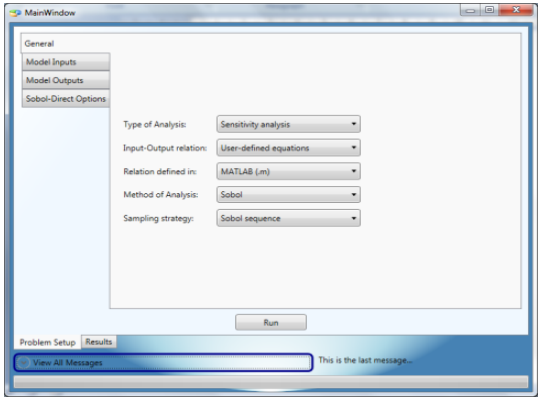

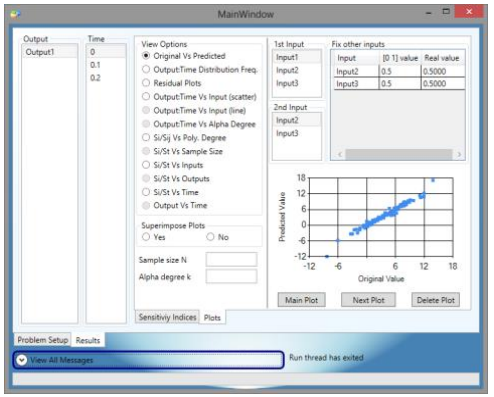

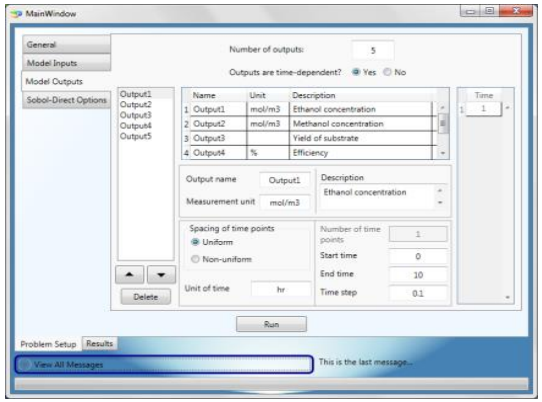

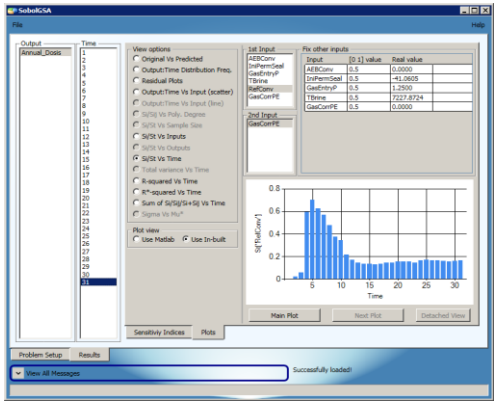

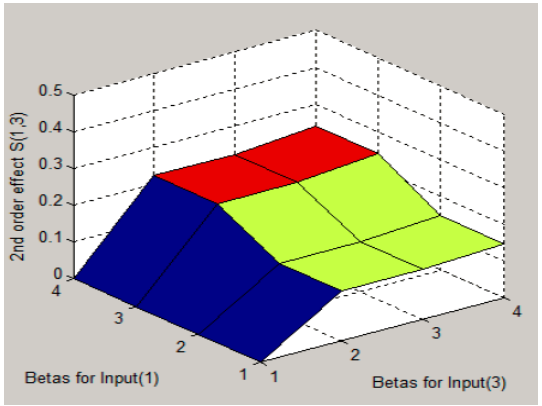

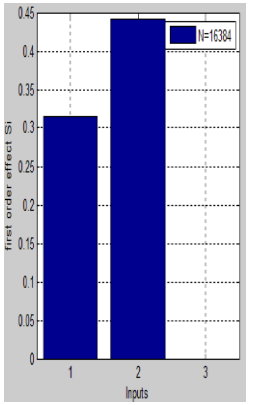

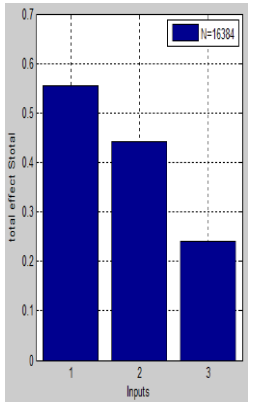

- Easy to use GUI
- Extensive set of cases studies, documentation and manuals
- Can be linked to MATLAB, gPROMS, Python and other packages
- Can handle explicitly defined models and models given as input-output data (black box models)
- Can handle several outputs for analysis; each output can be time-dependent
- Problem settings and results can be saved and then reloaded again
- Several GSA measures (Sobol' indices, derivative based measures (DGSM), Morris)
- Most advanced sampling methods (Mersenne twister, standard and scrambled Sobol' sequences)
- Different metamodelling techniques (QRS-HDMR, BSPCE, RBF)
- Produced metamodels given as self- contained C# / MATLAB/ Python files
- Produced metamodels can be used to perform global optimization within SobolGSA.
- Implemented Active subspaces (AS) method allows a significant dimension reduction

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3000 users worldwide including international pharmaceutical companies

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The Ishigami function

$$f(x_1, x_2, x_3) = \sin x_1 + a \sin^2 x_2 + b x_3^4 \sin x_1 \,,\; x'_i \in [-\pi, -\pi],\;\; i=1, 2, 3$$

Sobol' sensitivity indices can be computed analytically:

$$D = \frac{a^2}{8} + \frac{b\pi^4}{5} + \frac{b^2\pi^8}{18} + \frac{1}{2},$$
$$S_1^T = \frac{1}{D}\left[\frac{1}{2} + \frac{b\pi^4}{5} + \frac{b^2\pi^8}{18}\right], S_2^T = \frac{a^2}{8D}, S_3^T = \frac{b^2\pi^8}{225D}.$$

Case 1: *a*=7, *b*=0.1

Variable	S_i	S_i^T
1	0.31	0.55
2	0.44	0.44
3	0.0	0.24