QUEENS

Quantification of **U**ncertain **E**ffects in **En**gineering **S**ystems

The top-down view

QUEENS is a cutting-edge Python library for:

Sensitivity analysis

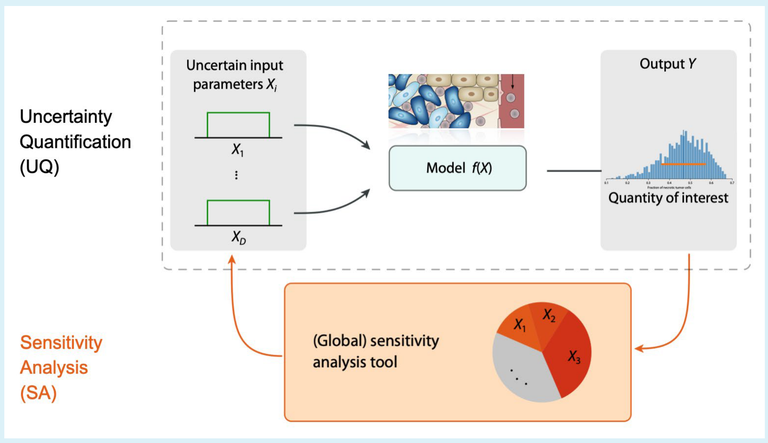
Parameter studies and identification

Uncertainty quantification

Surrogate modeling

Bayesian inverse analysis

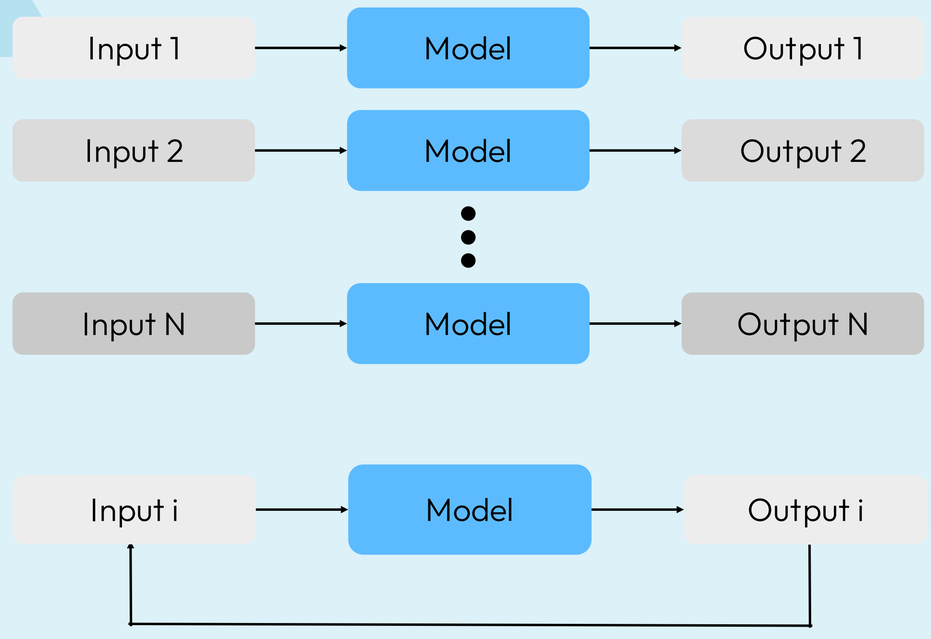
on distributed computer systems.



✓ Framework for fundamental research in probabilistic modeling.

The bottom-up view

QUEENS is a Python library for multi-query analysis of computational models focusing on modularity, extensibility, scalability, and simplicity.



✓ Automated evaluation of computational models.

Key design features

MODULARITY

- Compatible with most forward solvers (4C, OpenFOAM, Fenics, ...)
- Portable from laptop to HPC cluster.
- Easy exchange of methods.
- Nesting of functionality.

EXTENSIBILITY

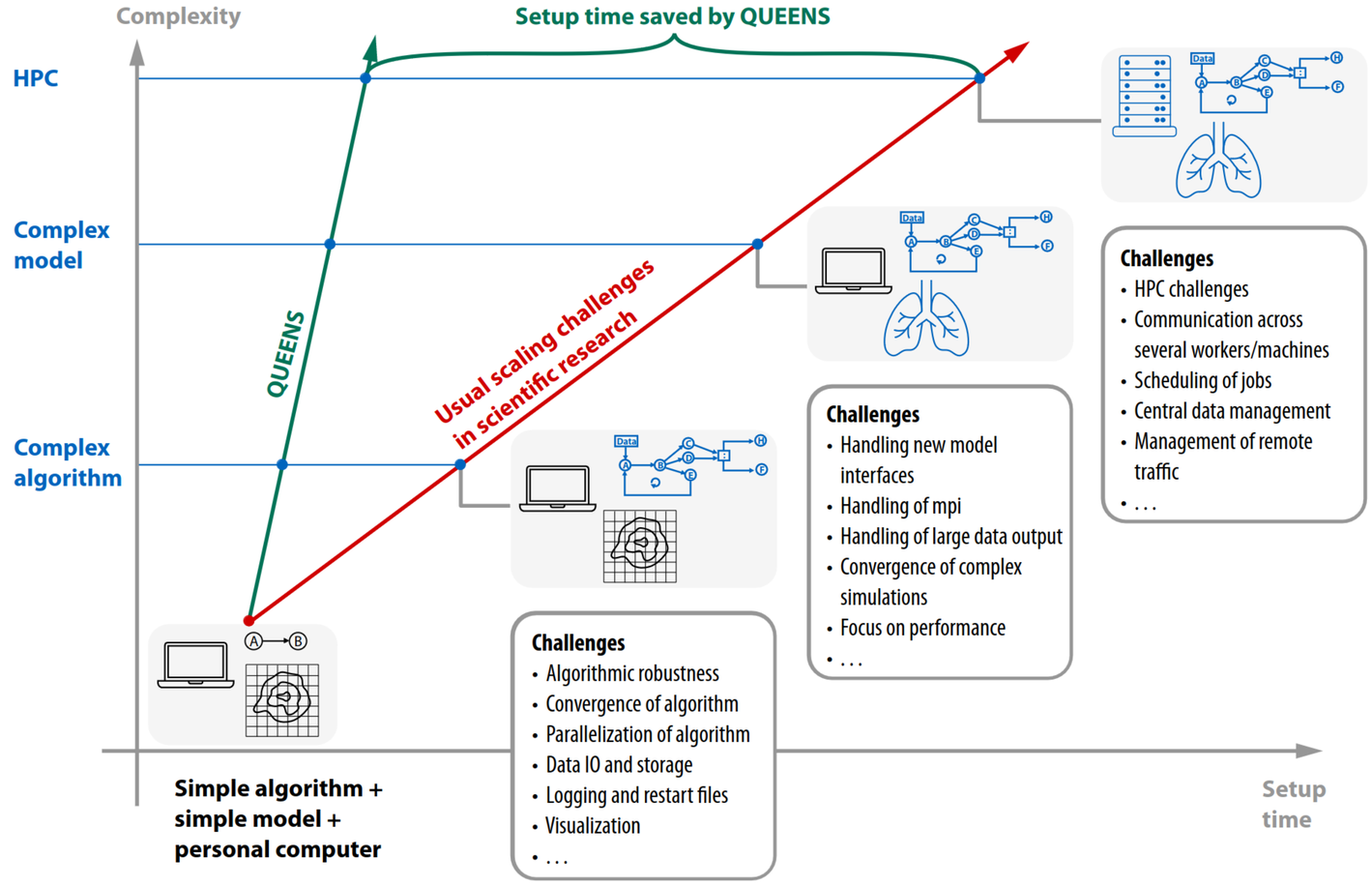
- Access to the entire Python ecosystem.
- Combinable with your own Python packages.

SCALABILITY

- Scalable to large problems.
- Scalable to large number of simultaneous model calls.

SIMPLICITY

- Calling sophisticated forward solvers with a single line of code and extracting quantity of interest from simulation output.
- Robustness through mature error handling.



AutoM(Q)Ate your research

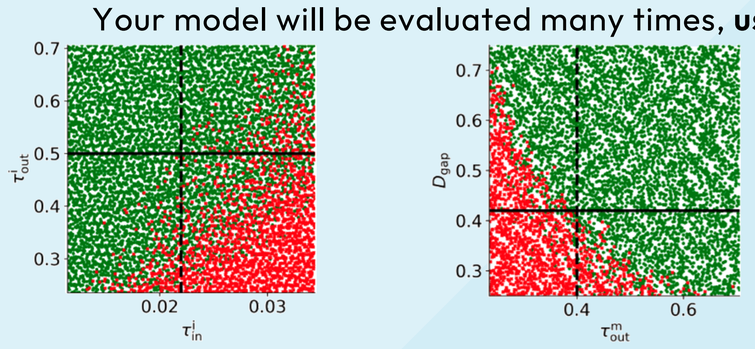
For coding:

- Automate your parameter sweeps
- Automate your verification and validation

For publications:

- Automate your parameter studies
- Automate model comparisons

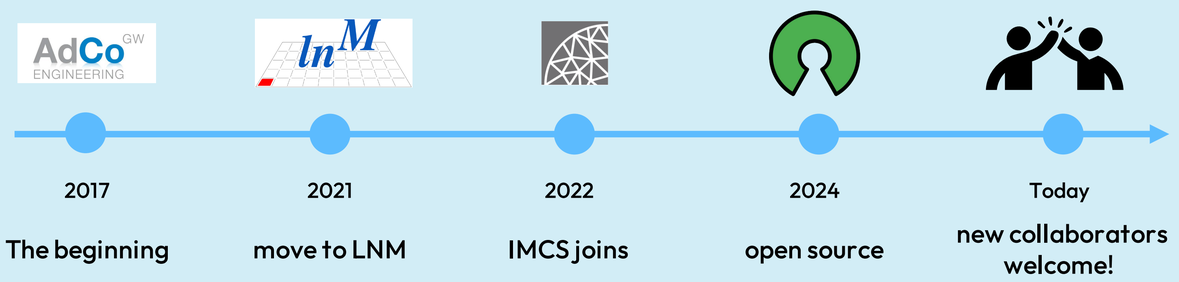
Your model will be evaluated many times, **use QUEENS to do so**



Successful simulations

Failed simulations

History



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Join us on Github!