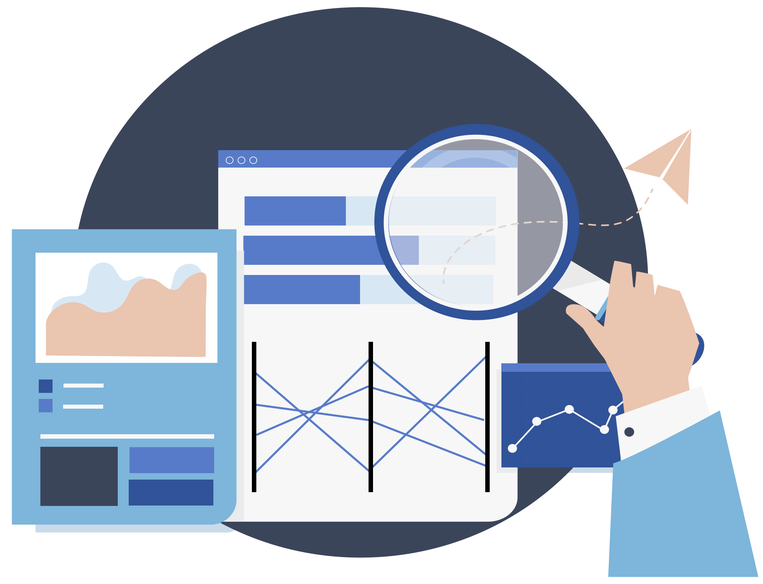
DESDEO software framework

DESDEO is an open-source Python-based software framework freely available for applying, developing, and experimenting with interactive multiobjective optimization methods.

The DESDEO software framework supports decision makers in the presence of multiple conflicting objective functions. It contains several interactive multiobjective optimization methods for decision makers to fluently apply in complex decision making in various problem domains.

Interactive methods directly involve a decision maker with domain expertise in finding the most preferred compromise reflecting their preferences. Thanks to the open and modular architecture, interactive methods are easily available and can be further developed. The framework consists of reusable components that can be utilized for implementing new methods or modifying the existing methods.

DESDEO is part of DEMO (Decision Analytics utilizing Causal Models and Multiobjective Optimization), which is a thematic research area of the University of Jyväskylä.



The main modules of DESDEO

desdeo-problem

Features for formulating and modeling multiobjective optimization problems.

desdeo-mcdm

Scalarization-based methods from the field of multiple criteria decision making (MCDM).

desdeo-emo

Population-based evolutionary multiobjective optimization (EMO) methods.

desdeo-tools

Utility tools required by EMO and MCDM methods, e.g., quality indicators.

DESDEO's benefits for students

Experimenting with multiobjective optimization methods has never been easier! The most well-known methods are available in DESDEO, together with a large set of benchmark and engineering test problems.

Implement methods faster and more efficiently. DESDEO's modular structure allows students to implement MCDM and EMO methods easily by reutilizing common building blocks.

DESDEO's benefits for researchers

Solve decision making problems. Implement and solve your own problems or experiment with various benchmark and engineering test problems available in DESDEO.

Improve the user experience of real decision makers. Utilize the visualizations and user interfaces available in DESDEO to help decision makers interact with the methods more efficiently.

Increase the visibility of your research. Implement your new interactive methods in DESDEO and make them freely available for researchers worldwide.

Learn more in our articles:

* G. Misitano, B. S. Saini, B. Afsar, B. Shavazipour and K. Miettinen, "DESDEO: The Modular and Open Source Framework for Interactive Multiobjective Optimization," IEEE Access, vol. 9, pp. 148277-148295, 2021, doi: 10.1109/ACCESS.2021.3123825

* B. S. Saini, D. Chakrabarti, N. Chakraborti, B. Shavazipour and K.Miettinen, "Interactive data-driven multiobjective optimization of metallurgical properties of microalloyed steels using DESDEO framework", Engineering Applications of Artificial Intelligence, vol. 120, Article 105918, 2023, doi: 10.1016/j.engappai.2023.105918

ACADEMY OF FINLAND

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Get involved

Fork DESDEO on Github!