`multiobjective.sty`
A LaTeXpackage for multiobjective optimization and multicriteria decision making*

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Abstract

This package provides a series of operators commonly used in papers related to multiobjective optimisation, multiobjective evolutionary algorithms, multicriteria decision making and similar fields.

1 Motivation

LaTeXdoes not explicitly includes the operators used in the fields related to multiobjective optimisation. Therefore, the appearance of those operators changes from paper to paper, sometimes leading to misunderstandings. The spirit behind this small package is to eliminate those variations.

2 Dominance operators

The operators contained in the package are summarized on table 1. Their formal definition can be found in [1, 2, 3].

3 Support definitions

Some extra features are included in addition to the previous operators, as shown on table 2. The `\argmin` and `\argmax` operators are babel–ready.

*This document corresponds to multiobjective v1.0, dated 2008/08/19.

Table 1: Dominance operators

Operator	Command	Sample
dominance	`\dom`	$\boldsymbol{x} \prec \boldsymbol{y}$
neg. dominance	`\negdom`	$\boldsymbol{x} \not\prec \boldsymbol{y}$
weak dominance	`\weakdom`	$\boldsymbol{x} \preccurlyeq \boldsymbol{y}$
neg. weak dominance	`\negweakdom`	$\boldsymbol{x} \not\preccurlyeq \boldsymbol{y}$
strict dominance	`\strictdom`	$\boldsymbol{x} \prec\!\!\prec \boldsymbol{y}$
neg. strict dominance	`\negstrictdom`	$\boldsymbol{x} \not\prec\!\!\prec \boldsymbol{y}$
multiplicative ϵ–dominance	`\multepsilondom`	$\boldsymbol{x} \preccurlyeq_{\epsilon\cdot} \boldsymbol{y}$
additive ϵ–dominance	`\addiepsilondom`	$\boldsymbol{x} \preccurlyeq_{\epsilon+} \boldsymbol{y}$
better	`\better`	$\mathcal{A} \triangleleft \mathcal{B}$

Table 2: Extra definitions

Description	Command	Sample
`\vec` redefinition	`\vec{`$\langle x \rangle$`}`	$\boldsymbol{x}$
sets	`\set{`$\langle A \rangle$`}`	$\mathcal{A}$
arg min operator	`\argmin_{sub=1\dots n} {F_i}`	$\arg\min_{sub=1\ldots n} F_i$
arg max operator	`\argmax_{sub=1\dots n} {F_i}`	$\arg\max_{sub=1\ldots n} F_i$

References

[1] Coello Coello, C. A., Lamont, G. B., & Van Veldhuizen, D. A. (2007). *Evolutionary Algorithms for Solving Multi-Objective Problems*, (2nd ed.). Genetic and Evolutionary Computation. New York: Springer.

[2] Deb, K. (2001). *Multi-Objective Optimization using Evolutionary Algorithms*. Chichester, UK: John Wiley & Sons. ISBN 0-471-87339-X.

[3] Ehrgott, M. (2005). *Multicriteria Optimization*. vol. 491 of *Lecture Notes in Economics and Mathematical Systems*. Springer.