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Applications of robust optimization models to portfolio selection problem

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Abstract

The abstract of about 150 words describing the main problems, results and conclusions presented in the paper. The abstract of about 150 words describing the main problems, results and conclusions presented in the paper. The abstract of about 150 words describing the main problems, results and conclusions presented in the paper. The abstract of about 150 words describing the main problems, results and conclusions presented in the paper. The abstract of about 150 words describing the main problems, results and conclusions presented in the paper.

Keywords: keyword 1, keyword 2, keyword 3, keyword 4, keyword 5

1. Introduction

Robust optimization is a field of optimization theory that deals with optimization problems in which a certain measure of robustness is sought against uncertainty that can be represented as deterministic variability in the value of the parameters of the problem itself and/or its solution [2]. A comprehensive description of robust optimization can be found in the book by Ben-Tal et al. [1]. Other reference [3].

Provide only necessary references. The number of references for nonsurvey papers should not exceed 30. For survey papers it may be larger. The references should be provided in a separate BibTex file.

The paper is organized as follows. In Section 2, we show...

2. Problem formulation

Definition 1. The robust optimization problem is defined as follows:

$$\max_{\boldsymbol{x}\in\mathbb{X}}\{f(\boldsymbol{x}):\ g(\boldsymbol{x},\boldsymbol{u})\leq \boldsymbol{b}\ \forall \boldsymbol{u}\in\mathbb{U}\} \tag{1}$$

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3. Solution algorithm

Figures should be inserted as eps files. All figures must be referenced (Figure 1).

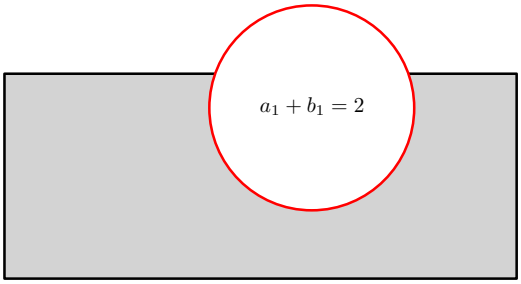

Figure 1. A sample figure.

Lemma 1. Write lemma here...

Proof. The proof of the lemma. We start by showing

$$a^2 + b^2 = c^2 \tag{2}$$

It follows from (2)... □

Lemma 2. Write lemma here...

Proof. The proof of the lemma.... □

Theorem 1. Write theorem here...

Proof. The proof of the theorem.... □

Corollary 1. Write corollary here...

Observation 1. Write observation here...

Write pseudocode of your algorithms using algorithm2e style.

Input: Array of integers $A = [a_1, \ldots, a_n]$
$max \leftarrow a_1$
for $k \leftarrow 2$ **to** n **do**
  if $a_i > max$ **then**
    $max \leftarrow a_i$
  end
end
return max

Algorithm 1: Finding the largest element

3.1. Special case

In this section we consider...

Theorem 2. Write theorem here...

Proof. The proof of the theorem.... □

3.1.1. Something else

Write here something else...

4. Computational tests

All tables must be referenced (Table 1 and Table 2). Big tables should fit to the size of the page. Very big table should be split to several smaller.

Table 1. The first table

Label 1	Label 2	Label 3	Label 3
Steve	23	33	12
Adam	3	3	12
Ewa	1		23

Table 2. The second table

Label 1	Label 2	Label 3	Label 3	Label 2	Label 3	Label 3	Label 2	Label 3	Label 3	Label 3	Label 3	Label 2	Label 3	Label 3
Steve	23	33	12	23	33	12	23	33	12	23	33	12	12	12
Adam	3	3	12	23	33	12	23	33	12	23	33	12	12	12
Ewa	1		23	23	33	12	23	33	12	23	33	12	12	12

5. Conclusions

Write your conclusions here.

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References

[1] Ben-Tal, A., El Ghaoui, L., and Nemirovski, A. *Robust Optimization*. Princeton University Press, 2009.

[2] Ben-Tal, A., and Nemirovski, A. Robust convex optimization. *Mathematics of Operations Research 23* (1998), 769–805.

[3] Karp, R. A generalization of binary search. In *Proceedings of the 3rd International Workshop on Algorithms and Data Structures, WADS'93* (1993), F. Dehne, J.-R. Sack, N. Santoro, and S. Whitesides, Eds., vol. 709 of *Lecture Notes in Computer Science*, Springer-Verlag, pp. 27–34.

A. Appendix

Write some additional proofs here...

B. Appendix

Write additional content here...