

AIGC检测 · 简洁报告单

NO:CNKIAIGC2025SG_202506106309097

检测时间: 2025-06-06 21:16:00

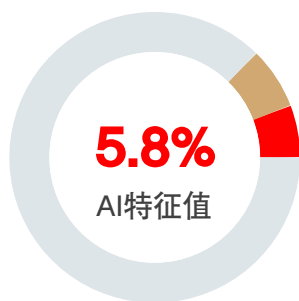
篇名: NPC problem

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文件名: NPC problem.pdf

全文检测结果 知网AIGC检测 <https://cx.cnki.net>



AI特征值: 5.8%

AI特征字符数: 1581

总字符数: 27060

- AI特征显著 (计入AI特征字符数)
- AI特征疑似 (未计入AI特征字符数)
- 未标识部分

AIGC片段分布图

前部20%

AI特征值: 19.5%

AI特征字符数: 1053

中部60%

AI特征值: 3.3%

AI特征字符数: 528

后部20%

AI特征值: 0.0%

AI特征字符数: 0



分段检测结果

序号	AI特征值	AI特征字符数 / 章节(部分)字符数	章节(部分)名称
1	6.3%	1053 / 16716	NPC problem_第1部分
2	5.1%	528 / 10344	NPC problem_第2部分

1. NPC problem_第1部分

片段指标列表

序号	片段名称	字符数		
1	片段1	964	<div><div></div></div>	5.8%
2	片段2	1053	<div><div></div></div>	6.3%

片段详情

NO.1	片段1	字符数: 964	AI特征: 疑似	<div><div></div></div>	5.8%
<p>Is P=NP:History and Frontier of NPC Problem</p> <p>Xianzhe Meng,U202410203,HUST 2025-06-06</p> <p>Abstract</p> <p>This paper delves into the theoretical underpinnings and algorithmic strategies surrounding NP- complete (NPC) problems, with a particular emphasis on the P vs NP conundrum. Emerging from Cook’ s 1971 demonstration of SAT’ s NP-completeness and Karp’ s subsequent reduction framework, NPC problems epitomize the most challenging problems within the NP class. The paper elucidates key complexity classes (P, NP, NPC, NP-hard), expounds NP-completeness through quintessential prob- lems like TSP and Vertex Cover, and examines proof strategies for both $P = NP$ (including algebraic methods) and $P \neq NP$. It also contemplates practical solutions such as approximation algorithms and parameterized tractability, alongside real-world applications. Ultimately, the study accentuates the ongoing theoretical challenges and the interdisciplinary ramifications of NPC research.</p>					
NO.2	片段2	字符数: 1053	AI特征: 显著	<div><div></div></div>	6.3%

1 Introduction

In the course of computational science development, NP-complete problems have always occupied a pivotal position. Back in 1971, it was Stephen Cook who, in his groundbreaking paper The Complexity of Theorem Proving Procedures (Cook, 1971), first introduced the concept of NP-completeness by proving SAT to be NP-complete. This achievement heralded an in-depth exploration of this unique class of problems.

Subsequently, Richard Karp harnessed polynomial- time reductions to demonstrate that 21 classical combinatorial problems, such as TSP and VCP, also fall into the NP-complete category, thereby significantly broadening the scope of this theoretical domain. At the heart of NP-complete problems lies the contentious issue of " P vs NP" . Designated as one of the Millennium Prize Problems by the Clay Mathematics Institute with a reward of one million dollars for its solution (Clay Mathematics Institute, 2000), this question underscores the profound significance and elusiveness of NP-complete problems within the academic community.

2. NPC problem_第2部分

AI特征值: 5.1% AI特征字符数 / 章节(部分)字符数: 528 / 10344

片段指标列表

序号	片段名称	字符数		
3	片段1	528	<div><div></div></div>	5.1%
4	片段2	891	<div><div></div></div>	8.6%

片段详情

NO.3

片段1

字符数: 528

AI特征: 显著

5.1%

2. Fault detection in circuits (identifying critical components).

3. Social network analysis (identifying influencers in viral marketing).

In summary, the Vertex Cover Problem has served as a cornerstone of computational complexity theory for decades. Its study has driven innovations in approximation algorithms, parameterized complexity, and practical optimization techniques. While exact solutions remain intractable for large graphs, ongoing research continues to expand the boundaries of computational feasibility.

NO.4

片段2

字符数: 891

AI特征: 疑似

8.6%

Looking ahead, research on NP-complete problems remains a fertile frontier. Efforts persist on multiple fronts: enhancing approximation and fixed-parameter algorithms for challenging cases; designing superior heuristics and hybrid methods for practical

instances; and exploring new theoretical techniques (stronger circuit lower bounds, algebraic methods, or perhaps entirely new models of computation). Even if $P \neq NP$ ultimately remains unproven, advances in related areas (such as complexity theory, proof systems, and optimization theory) continue to refine our understanding and often yield practical algorithmic improvements. In summary, the NP-complete class encapsulates a rich history and enduring challenge: the depth and breadth of work to date testify to its importance, and resolving its remaining questions would have profound consequences both in theory and in applications.

说明:

- 1、支持中、英文内容检测;
- 2、AI特征值=AI特征字符数/总字符数;
- 3、红色代表AI特征显著部分, 计入AI特征字符数;
- 4、棕色代表AI特征疑似部分, 未计入AI特征字符数;
- 5、检测结果仅供参考, 最终判定是否存在学术不端行为时, 需结合人工复核、机构审查以及具体学术政策的综合应用进行审慎判断。



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