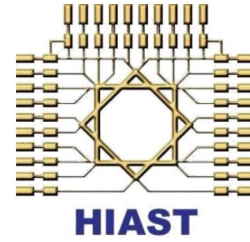


Syrian Arab Republic  
Higher Institute for Applied Sciences and Technology  
Informatics Department  
Fourth Year



# Using Genetic Algorithms to Find Approximations for the Minimum Vertex Cover Problem

Keywords: genetic algorithms, NP-complete, combinatorial optimization,  
non-deterministic algorithms, approximation algorithms, minimum vertex cover.

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February 21, 2018

## **Abstract**

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# Contents

Cover Page	i
Abstract	ii
Contents	iii
1 Introduction	1
2 Genetic Algorithms	1
3 The Minimum Vertex Cover Problem	1
4 Experimental Results	1
5 Conclusion	2
References	3

# 1 Introduction

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# 2 Genetic Algorithms

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# 3 The Minimum Vertex Cover Problem

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# 4 Experimental Results

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## 5 Conclusion

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## References

- [1] T. Back and S. Khuri. “An evolutionary heuristic for the maximum independent set problem”. In: *Evolutionary Computation, 1994. IEEE World Congress on Computational Intelligence., Proceedings of the First IEEE Conference on*. IEEE. 1994, pp. 531–535.
- [2] D. Coley. *An Introduction to Genetic Algorithms for Scientists and Engineers*. World Scientific, 1999.
- [3] P. A. M. Dirac. *The Principles of Quantum Mechanics*. International series of monographs on physics. Clarendon Press, 1981.
- [4] A. Einstein. “Zur Elektrodynamik bewegter Körper. (German) [On the electrodynamics of moving bodies]”. In: *Annalen der Physik* 322.10 (1905), pp. 891–921.
- [5] D. Goldberg. *Genetic Algorithms in Search, Optimization, and Machine Learning*. Artificial Intelligence. Addison-Wesley Publishing Company, 1989.
- [6] G. D. Greenwade. “The Comprehensive Tex Archive Network (CTAN)”. In: *TUGBoat* 14.3 (1993), pp. 342–351.
- [7] S. Khuri and T. Bäck. “An evolutionary heuristic for the minimum vertex cover problem”. In: *Genetic Algorithms within the Framework of Evolutionary Computation—Proc. of the KI-94 Workshop*. Saarbrücken, Germany. 1994, pp. 86–90.
- [8] D. E. Knuth. *The Art of Computer Programming*. Four volumes. Seven volumes planned. Addison-Wesley, 1968.