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Optimization in Computer Engineering—Theory and Applications: Book Review of Chapter 8—Applying Graph Coloring to Frequency Assignment

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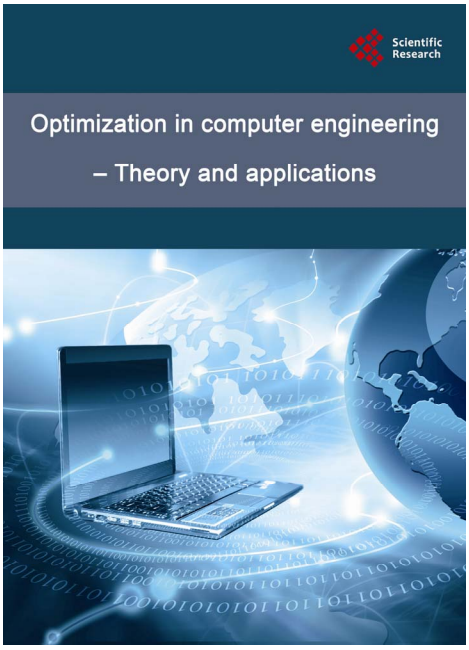

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The chapter gives a concise and clear presentation of the basic concepts and the variants of the graph coloring problem. It discusses the link between these variants. It uses a very simple and clear language that is at the grasp of an average engineering or science undergraduate student. It then focuses on discussing the applicability of the graph coloring problem to Frequency Assignment Problem (FAP). It precisely selects a special case of this problem: the Fixed Channel Assignment (FCA).

The chapter gives a clear explanation of the common application domains of the Frequency Assignment problem such as radio and television transmission, military applications needs, satellite communication, and frequency planning of WLANs. The transition from FAP to graph coloring problem is well explained by using simple examples and graphical illustrations. The empirical assessment of the efficiency of the applied algorithm on FAP instance and random graphs is presented by giving the process, and the results. The implementation is carried using the Budapest Complexity Analysis Toolkit (BCAT).

The content of the chapter is expected to age gracefully. It tackles a problem that is relevant today and will remain pertinent for many years to come. The title of the chapter is accurate. It captures the method and the subject that is tackled in the chapter. The examples are simple and easy to follow and the illustrations are appropriate and well executed.

The chapter is not only written is a clear natural language but also complying with technical accuracy, which makes its content accessible and suitable to a variety of readers. A reader with a basic background in optimization has access to the material presented in the chapter. At the same time, an expert can find very interesting the empirical assessment of the complexity of solving FAPs.

The chapter would benefit from a better explanation for the rational of the empirical study. Explaining the reasons for focussing the study on increasing edge density, increasing the number of vertices, and on increasing the number of colors would help a non-expert reader understand its rational.

In general the chapter is a wellarticulate piece of work and presents a lasting contribution to the field that is accessible to a wide audience.

