# Dieter Rautenbach



# 50 anos



"Hello, Dieter! Congratulations on your 50th birthday! I have nice memories of my stays in Ulm, you were always an excellent host. So thank you very much for giving me the opportunity to collaborate with you and the people on your team. Hope to see you again soon! Regards, Fábio"

## Fábio Protti 2022

"Além de genial e competente, como todos sabem, suas qualidades vão além das profissionais. Além das interações que tivemos no Brasil, durante o período sanduíche ele tornou a minha vida "fora do escritório" muito mais agradável, sempre solícito nas dificuldades e também nos momentos divertidos como as partidas de Fußball e na viagem a Rothenburg. Feliz aniversário, Dieter! Continue sendo este grande exemplo para todos nós!"

Vinícius Santos 2022 "Talking about Dieter Rautenbach is apparently an easy task, but actually difficult.

It is easy because there is so much to say about Dieter, that one can just pick up a few points, as for example, his mathematical genianiality, about his generosity, about his personal qualities, about his working capacities, about the speed of his mind, and many others.

On the other hand, the excess of choices makes the task really difficult, as by choosing to mention a certain point, we do nor leave space for others.

In my long career as a researcher, I have been lucky enough as to have the opportunity to work with some of the top authors in discrete mathematics and computer science. I must confess that Dieter impressed me above all. And still does !

I had the chance to direct a research project jointly with Dieter, for about 6 years. This period was extremely important for me, and still I can feel some of its effects. I must also mention the importance of Dieter Rautenbach to Brazil. His activities were not restricted to one brazilian university, but spread to many others.

Again, I reconfirm that having met Dieter Rautenbach was one of the most important facts that happened in my life, both on the scientific and personal point of views "

Jayme L Szwarcfiter July 20, 2022

# Brazilian Symposium on Graphs. Algorithms and Combinatorics

in conjunction with CIMPA School on Algorithms and Combinatorics

March 17-19, 2001, Fortaleza, Ceará State, Brazil







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#### Convex Partitions of Graphs induced by Paths of Order Three

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A set C of vertices of a graph G is  $P_3$ -convex if  $v \in C$  for every path uvw in G with  $u, w \in C$ . We prove that it is NP-complete to decide for a given graph G and a given integer p whether the vertex set of G can be partitioned into p non-empty disjoint  $P_3$ -convex sets. Furthermore, we study such partitions for a variety of graph classes.

Keywords: graph convexity; convex partition

#### 1 Introduction

In [4] Bollobás considers "The spread of an infection on a square grid". Initially some squares of a square grid are infected. The infection spreads to an uninfected square if at least two of the neighbouring squares are infected. A natural combinatorial problem — solved using an elegant perimeter argument in [4] — is to determine the minimum number of initially infected squares such that eventually all squares become infected. This kind of spreading process has received considerable attention in a variety of contexts such as social influence [15], percolation [3], marketing strategies [10], and distributed computing [25]. In the present paper we study the above process under the perspective of graph convexity.

All graphs will be finite, simple, and undirected and we use common terminology and notation. Given a graph G and a collection C of subsets of the vertex set V(G) of G, the pair (G, C) is a graph convexity if  $\emptyset \in C$ ,  $V(G) \in C$ , and C is closed under intersection. The sets in C are called convex. The convex hull of some set S of vertices of some graph G with respect to some graph convexity (G, C) is the unique smallest set  $H_C(S)$  in C containing S. Several natural graph convexities are defined in terms of paths. If  $\mathcal{P}$  is a set of paths in some graph G and C is the collection of all subsets C of V(G) such that, for every path P in  $\mathcal{P}$  between two vertices in C, the set C contains all vertices of P, then (G, C) is a graph convexity.

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38<sup>th</sup> International Workshop on Graph Theoretic Concepts in Computer Science Ramat Rachel, Jerusalem June 26 - 28, 2012

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#### **General Information**

The WG 2012 conference will be held at Ramat-Rachel on the outskirts of Jerusalem, Israel, from the 26th of June to the 28th of June 2012, with participants expected to arrive on the 25th of June. It continues a long series of 37 previous WG's. Since 1975, it has taken place twenty times in Germany, four times in the Netherlands, twice in Austria, Czech Republic and France as well as once in Italy, Slovakia, Switzerland, Norway, Prague, Greece and the United Kingdom.

### **Aims and Scope**

WG 2012 aims at uniting theory and practice by demonstrating how Graph-Theoretic concepts can be applied to various areas in Computer Science, or by extracting new problems from applications. The goal is to present recent research results and to identify and explore directions of future research. The conference is well-balanced with respect to established researchers and young scientists. The proceedings will be published in the LNCS series of Springer-Verlag.

Papers are solicited describing original results on all aspects of graph-theoretic concepts in Computer Science, e.g. structural graph theory, sequential, parallel, randomized, parameterized, and distributed graph and network algorithms and









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