

Editorial Preface



This special issue "Combinatorial Algorithms, Dedicated to the Memory of Mirka Miller" stems from two editions of the International Workshop on Combinatorial Algorithms, IWOCA 2014 held in Duluth, Minnesota, in October 2014, and IWOCA 2015 held in Verona, Italy, in October 2015. In the course of its preparation, though, it has become a bitter-sweet work of tribute to the third guest-editor, Mirka Miller, who passed away in early 2016. We have been running most of the editorial work in honor of our good friend and renowned combinatorialist, with sadness and grief in our hearts. And yet with equal amount of gratitude that our professional lives were allowed to meet and we were able to enjoy a wonderful collaboration.

Mirka Miller, the Miss Combinatoriality of Czech and Australia, grew up in communist Czechoslovakia, where she experienced easing of the political situation during the Prague Spring of 1968. Being open-minded, adventurous and courageous she could not but break the communist imposed rules, and she illegally emigrated from her fatherland after the invasion of Soviet army in August 1968. Soon Australia became her new home. Whatever she did, she would always be doing with full commitment and sincere efforts to be the best in the world. And so she made it into the women's national volleyball team of Australia, she lived for several years on a remote Lord Howe Island taking care of her son Filip, until finally Mathematics became her destiny and Newcastle and the nearby Stockton Beach became her home for good. Many international visitors as well as many of her students will forever remember graph theory sessions on the deck of her house or in a nearby beach café, with refreshing breaks in the mighty surf of the Pacific Ocean being allowed and even encouraged by Mirka. Of course, Mirka was not only an excellent host to her visitors, she was a devoted traveler herself. Strong links between the Graph Theory and Combinatorics communities of Indonesia, China, Slovakia, and Catalunya on the one hand, and Australia on the other were established or maintained with her decisive help. In the last decade she accepted a part time position in Pilsen, Czech Republic, and this regularly brought her back to her original home country during frequent visits to Pilsen and Prague.

For years Mirka Miller has been the driving force behind IWOCA, previously known as AWOCA – the Australian, and later International Workshop on Combinatorial Algorithms. She has been a member of its steering committee for decades, she was one of those who strongly pushed AWOCA to go international in 2007 – when it changed its name to International Workshop on Combinatorial Algorithms –, and she was one of the guest editors in 2009 when IWOCA first published its proceedings in Lecture Notes of Computer Science at Springer. Her role for IWOCA to get established on the international scene of regular computer science conferences has been vital. And as she had guest-edited two special issues of European Journal of Combinatorics stemming from IWOCA 2009, a conference that she co-chaired, she was also at the beginning of this special issue, participating in the process of selecting papers from IWOCA 2014. But then a serious illness struck, and the other guest editor joined forces with the PC chair of IWOCA 2015. For a while we hoped to get this special issue to the hands of the publisher in time to please Mirka and help brighten her hard days. The illness was

http://dx.doi.org/10.1016/j.ejc.2017.07.007 0195-6698/© 2017 Published by Elsevier Ltd. faster. So let this volume be a tribute to Mirka's life and work, to her achievements in Combinatorics and Graph Theory, and to her crucial role in establishing the IWOCA conference series.

Mirka's professional interests were broadly anchored in the realm of Graph Theory and Combinatorics. Her most intensive work was in the areas of degree-diameter problems, construction of extremal graphs, graph labelings of different types, domination theory in graphs, but also in applications of linear algebra and graph theory methods in database security. And similarly diverse are the topics of papers included in this special issue.

We start with a section on classical Graph Theory problems. Stepan Artamonov and Maxim Babenko study a generalization of matchings in graphs. Avoiding or minimizing edge crossings in drawings of graphs on one or two pages is a goal for a graph drawing paper of Carla Binucci, Emilio Di Giacomo, Md. Iqbal Hossain, and Giuseppe Liotta. Ilkyoo Choi, Jan Ekstein, Přemysl Holub, and Bernard Lidický push forward our knowledge of 3-coloring triangle-free planar graphs in the setting of extending a precoloring of a specified cycle. Daniel Freund, Matthias Poloczek, and Daniel Reichman deal with bootstrap percolation in dense graphs, and present extremal results for the existence of percolating sets. Nils Kriege, Florian Kurpicz, and Petra Mutzel study the computational complexity of the Maximum Common Subgraph problem for classes of graphs of bounded tree-width and obtain results for tree-width 2 graphs, a.k.a. series-parallel graphs.

Designs, general combinatorial questions, enumeration and extremal problems are served in the second section. It starts with a paper on Heat Kernel Pagerank and Local Clustering by Fan Chung and Olivia Simpson. This paper provides an excursion into a part of Combinatorics now commonly known as Statistical Physics. Saad El-Zanati, Uthoomporn Jongthawonwuth, Heather Jordon, and Charles Vanden Eynden show an explicit construction of partitions of complete graphs thus constructing block designs of certain parameters. Petr A. Golovach, Pinar Heggernes, and Dieter Kratsch show how to enumerate minimal connected vertex covers of graphs. Klaus Jansen and Stefan Kraft provide a greatly improved fully polynomial time approximation scheme (FPTAS) for a classical combinatorial Knapsack Problem, the first improvement in several decades. Meirav Zehavi shows that the *k*-Leaf Spanning Tree Problem allows a relatively high Klam value, an important value for the Fixed Parameter Tractability of the problem.

Combinatorics of words, or Stringology, has always been a strong topic at IWOCA. The third and last section is devoted to this area. Francine Blanchet-Sadri, Michelle Cordier, and Rachel Kirsch take a more general point of view on border correlations of partial words (strings where some letters are unknown) and successfully exploit the subgraph component polynomial of Tittmann et al. Another paper on partial words, devoted to square roots and primitively rooted squares and runs, is due to Francine Blanchet-Sadri, Justin Lazarow, Jordan Nikkel, J.D. Quigley, and Xufan Zhang. Béla Bollobás and Shoham Letzter tighten current bounds on variants of the Longest common extension problem, in strings, partial words, and strings with randomly appearing holes. Finally, the paper of Mikhail Rubinchik and Arseny M. Shur provides a useful data structure for detecting and processing palindromes in strings.

We hope the reader will find the selection of the papers included in this volume as interesting and intellectually invigorating as we are sure Mirka would have.

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Available online 7 August 2017