20th International Workshop on Algorithms in Bioinformatics

WABI 2020, September 7–9, 2020, Pisa, Italy (Virtual Conference)

Edited by

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◼ **Preface**

This proceedings volume contains papers presented at the 20th Workshop on Algorithms in Bioinformatics (WABI 2020), which was virtually held in Pisa, Italy, September 7–9, 2020.

The Workshop on Algorithms in Bioinformatics is an annual conference established in 2001 to cover all aspects of algorithmic work in bioinformatics, computational biology, and systems biology. The conference is intended as a forum for presentation of new insights about discrete algorithms and machine-learning methods that address important problems in biology (particularly problems based on molecular data and phenomena); that are founded on sound models; that are computationally efficient; and that have been implemented and tested in simulations and on real datasets. The meeting's focus is on recent research results, including significant work-in-progress, as well as identifying and exploring directions of future research.

This 20th edition of WABI took place in the year of the COVID-19 pandemic emergency. This presented some logistic challenges, but also served to highlight the importance of the development of advanced computational methodologies for understanding biological problems. Over the 20 instances of WABI, computational biology has grown significantly in importance, and now computational analysis methods — some furthered significantly over the years at WABI — are crucial to quickly understanding the evolution and function of the agent of a global health crisis.

WABI 2020 was organized within the ALGO federation of conferences that in 2020 included WABI, ESA (European Symposium on Algorithms), ALGOCLOUD (International Symposium on Algorithmic Aspects of Cloud Computing), ALGOSENSORS (International Symposium on Algorithms and Experiments for Wireless Sensor Networks), ATMOS (International Symposium on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems), and WAOA (Workshop on Approximation and Online Algorithms).

Because of the COVID-19 pandemic, the ALGO Organizing Committee decided to run the affiliated conferences online exclusively. On the other hand, the scientific aspects were not affected, except for a somewhat lower number of submissions that fortunately maintained the high quality of WABI standards. The activity of the Programme Committee of WABI took place as usual: peer review, discussion, selection of accepted papers, and publishing of the proceedings have been accomplished in the same way as in all WABI editions.

In 2020, a total of 38 manuscripts were submitted to WABI from which 19 were selected for presentation at the conference and are included in this proceedings volume as full papers. Extended versions of selected papers have been invited for publication in a thematic series in the journal Algorithms for Molecular Biology (AMB), published by BioMed Central. The 19 papers selected for the conference underwent a thorough peer review, involving at least three (and often four or five) independent reviewers per submitted paper, followed by discussions among the WABI Program Committee members. The selected papers cover a wide range of topics including phylogenetic trees and networks, biological network analysis, sequence alignment and assembly, genomic-level evolution, sequence and genome analysis, RNA and protein structure, topological data analysis, and more. They are ordered randomly within this volume.

We thank all the authors of submitted papers and the members of the WABI 2020 Program Committee and their subreviewers for their efforts that made this conference possible. We are also grateful to the WABI Steering Committee for their help and advice. We thank all the conference participants, session chairs, and speakers who contributed to

a great scientific program. In particular, we are indebted to the keynote speaker of the conference, Dan Gusfield (University of California Davis), for his presentation, and to the two WABI invited speakers Valentina Boeva (ETH Zurich and Institute Cochin Paris) and Erik Garrison (University of California Santa Cruz). WABI 2020 is grateful for the support of the University of Pisa. We thank ALGO 2020 Organizing Committee for setting up the event in these complicated times due to the pandemic emergency.

Previous proceedings of WABI appeared in LNCS/LNBI volumes 2149 (WABI 2001, Aarhus), 2452 (WABI 2002, Rome), 2812 (WABI 2003, Budapest), 3240 (WABI 2004, Bergen), 3692 (WABI 2005, Mallorca), 4175 (WABI 2006, Zurich), 4645 (WABI 2007, Philadelphia), 5251 (WABI 2008, Karlsruhe), 5724 (WABI 2009, Philadelphia), 6293 (WABI 2010, Liverpool), 6833 (WABI 2011, Saarbrücken), 7534 (WABI 2012, Ljubljana), 8126 (WABI 2013, Sophia Antipolis), 8701 (WABI 2014, Wroclaw), 9289 (WABI 2015, Atlanta), and 9838 (WABI 2016, Aarhus). As of 2016, they appeared in LIPICS volumes 88 (WABI 2017, Boston), 113 (WABI 2018, Helsinki), and 143 (WABI 2019, Boston).

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