

# **Proceedings of the International Neural Networks Society**

Volume 1

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Luca Oneto · Nicolò Navarin ·  
Alessandro Sperduti · Davide Anguita  
Editors

# Recent Advances in Big Data and Deep Learning

Proceedings of the INNS Big Data  
and Deep Learning Conference, INNSBDDL2019,  
held at Sestri Levante,  
Genova, Italy, 16–18 April, 2019

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# Preface

This book presents 39 original articles that have been accepted to the 2019 INNS Big Data and Deep Learning (INNS BDDL), a major event for researchers in the field of artificial neural networks, big data, and related topics, organized by the International Neural Network Society (INNS) and hosted by the University of Genoa.

In 2019, INNS BDDL will be held in Sestri Levante (Italy) from April 16 to April 18. Sestri Levante is a town in Liguria, Italy. Lying on the Mediterranean Sea, it is approximately 56 kilometers (35 mi) south of Genoa and is set on a promontory. While nearby Portofino and the Cinque Terre are probably the best-known touristic destinations on the Italian Riviera, Sestri Levante has several beautiful natural bays for visitors.

In addition to regular sessions, INNS BDDL regularly welcomes tutorials organized by renowned scientists in their respective fields and international renowned invited speakers.

The contributions in this book show that INNS BDDL covers a broad range of topics in big data and deep learning, from theoretical aspects to state-of-the-art applications. More than 80 researchers from 20 countries participated in the INNS BDDL in April 2019. Around 40 oral communications and 6 tutorials have been presented this year together with 4 invited plenary speakers.

The editors would like to thank all the authors for their interesting contributions and all reviewers for their excellent work. Authors and reviewers were asked to respect a very tight schedule, which allowed this book to be published close to the end of the conference. We would also like to thank Springer for giving us the opportunity to publish this book and for the very efficient and seamless management of the publication procedure. Finally, we would like to thank the sponsors, the program committee, and the INNS for their precious and fundamental support.

The Editors

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