

Multivariate Approximation: Theory, Algorithms & Applications (MATAA17)

Roberto Cavoretto^a · Alessandra De Rossi^a

Abstract

The guest editors and organizers of the mini-workshop “*Multivariate Approximation: Theory, Algorithms & Applications*” (MATAA17) summarize the main facts of the meeting.

1 Report on the mini-workshop

The mini-workshop “*Multivariate Approximation: Theory, Algorithms & Applications*” (MATAA17) was held on May 25-26, 2017 at the Department of Mathematics “Giuseppe Peano” of the University of Torino, Italy.

Throughout this two-day event we had a total of 10 talks and overall about 30-35 participants, also including some M.Sc. students of the University of Torino. The invited lectures were given by

- Oleg Davydov (University of Giessen, Germany),
- Francesco Dell’Accio (University of Calabria, Italy),
- Elisa Francomano (University of Palermo, Italy),
- Kai Hormann (University of Lugano, Switzerland),
- Maria Grazia Russo (University of Basilicata, Italy),

while the contributed talks were by Filomena Di Tommaso (University of Calabria, Italy), Michael S. Floater (University of Oslo, Norway), Emma Perracchione (University of Padova, Italy), Milvia Rossini (University of Milano-Bicocca, Italy), and Alessandra Sestini (University of Firenze, Italy).



Figure 1: Group of some participants during a break time of the meeting.

^aDepartment of Mathematics “Giuseppe Peano”, University of Torino, via Carlo Alberto 10, 10123 Torino, Italy
E-mails: roberto.cavoretto@unito.it, alessandra.derossi@unito.it

We would like to sincerely thank the speakers and all the participants for making the workshop a success. This meeting was indeed organized to provide a meeting point and a forum for researchers who mainly work in the field of approximation theory and its applications. However, it was open to all people interested to topics of numerical analysis, applied mathematics and scientific computing. The complete details of the mini-workshop are available on the website:

<https://sites.google.com/site/mataa17torino/>

During the workshop we invited the speakers to submit papers for a special volume of *Dolomites Research Notes on Approximation* (DRNA). All submissions were peer-reviewed and accepted articles are part of this special issue dedicated to MATAA17. As organizers of the mini-workshop and guest editors of DRNA, we would also like to express our sincere gratitude to the reviewers for their suggestions and comments to the authors. Sincere thanks are then addressed to our colleagues and friends of the University of Padova, who enabled the fulfillment of this special volume. Finally, we are very grateful to the Department of Mathematics “Giuseppe Peano” of the University of Torino for financial and logistical support.

2 Papers of the MATAA17 special issue

In the following, we briefly describe the contents of the various papers published on this special volume of DRNA.

Paper 1, by Rossini, faces the problem of recovering functions with discontinuities starting from a set of scattered data points. It aims to find out gradient discontinuities in one and two dimensions. The proposed approach is based on the use of Variably Scaled Kernels (VSKs), which can change their smoothness locally according to the position of the discontinuities. This is achieved by suitable choices of the scale function.

Paper 2, by De Rossi, Perracchione and Venturino, deals with the problem of detecting and reconstructing the attraction basins coming from dynamical systems. This task is solved by computing separatrix points and then approximating the related manifolds via a meshfree interpolation tool, known as the Radial Basis Function Partition of Unity (RBF-PU) method. The detection algorithm effectively works for dynamical systems of two equations and allows the treatment of periodic orbits.