

## ACAT Advanced School Bologna 2012

### Scientific report

The ACAT Advanced School was scheduled for February 3-4, 2012, but had to be postponed to May 25-26 because of an abnormal snowfall in Bologna and in all the region which caused the closure of the airport and huge delays in railway traffic. The School was essentially meant to be a set of synthetic tutorials on the main subjects to be dealt with in the subsequent CTIC 2012 Conference. Actually, several of the conference attendees took part in the School, but also many other PhD and Master students from Bologna and nearby universities attended the classes.

There has been financial support by the Department of Mathematics of the Univ. Bologna, by the National Institute for High Mathematics and – with seven grants, for which there has been a big delay and some trouble with taxation – by the Bolognese Camera di Commercio.

The lecturers were:

Dr. Alessandro Bevilacqua, Univ. Bologna, for Computer Vision

Prof. Herbert Edelsbrunner, Inst. of Science and Technology, Austria, for Persistent Topology

Prof. Neža Mramor Kosta, Univ. Ljubljana, for Discrete Morse Theory

Prof. Marian Mrozek, Jagiellonian Univ., Kraków, for Computational Homology.

The lectures were organized in alternate sessions of 90 minutes each, two subjects a day as follows:

*Friday 25:* Welcome - Computer Vision – Coffee Break – Persistent Topology – Lunch – Computer Vision – Coffee Break – Persistent Topology – Presentation of the ACAT Project.

*Saturday 26:* Computational Homology – Coffee Break – Discrete Morse Theory – Lunch – Computational Homology – Coffee Break – Discrete Morse Theory – Final greetings.

There were 54 participants (lecturers and organizers included) from 12 countries. The lectures were very well tuned to the goal of providing the bases of the respective subjects. Even the youngest students attended up to the end with attention and concentration, although for many of them it was the first experience of advanced courses in a foreign language. A concrete sign of this was the question, by a group of Bolognese students, whether there will be more such schools in the future...

Less satisfactory was the interaction among different groups during coffee breaks and lunches. Above all the Italian students were presumably hindered by their scarce confidence with English, although – as they stated when questioned – that was no obstacle to comprehension in class.