Computational & Algorithmic Topology in Sydney

The University of Sydney, 2–4 April 2014

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Reasons for holding the meeting

This workshop at the University of Sydney brought together experts and emerging researchers from Australia, the USA and Europe to report on recent results and explore future directions in computational and algorithmic topology. A focus was placed on problems in low-dimensional geometry and topology and on the development of practical algorithms and their implementation. This is an area with an abundance of computational and algorithmic challenges, where practical solutions to many solvable problems, such as the homeomorphism problem, remain elusive. Five of the nine speakers develop freely available software to assist in their theoretical research or in the analysis of their algorithms and computational techniques.

The methods and key notions of this workshop appealed to a broad audience: even though it was held during a teaching week, it attracted 29 registered participants. The organiser is extremely pleased that 9 of the 29 participants were students, and anecdotal evidence shows that the workshop was not only beneficial to the experts in the field, but also to the early career researchers and students who attended. Many informal discussions were facilitated through the catered tea and lunch breaks. The high quality of the talks and the relaxed atmosphere not only stimulated interaction, but brought about new collaborations on difficult problems that cannot be tackled from one viewpoint alone.

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Speakers

Visit http://www.maths.usyd.edu.au/u/tillmann/cats2014/ for the conference webpage. The following talks were given at the workshop:

1. Mark Bell (University of Warwick)
   Deciding Nielsen–Thurston types of surface diffeomorphisms
2. Ben Burton (The University of Queensland)
   Exploring parameterised complexity in computational topology
3. Nathan Dunfield (University of Illinois at Urbana–Champaign)
   Floer homology and orderability of 3-manifold groups
4. Stefan Friedl (University of Köln)
   The profinite completion of knot groups
5. Joachim Gudmundsson (The University of Sydney)
   Geometric spanner graphs
6. Joan Licata (Australian National University)
   Front diagrams via open book decompositions
7. Jessica Purcell (Brigham Young University)
   Geometrically maximal knots
8. Hyam Rubinstein (The University of Melbourne)
   Even triangulations of manifolds
9. Saul Schleimer (University of Warwick)
   'Fibered class' lies in NP
10. Jonathan Spreer (The University of Queensland)
    Bounds for the genus of a normal surface