Report on NII Shonan Meeting 2013-018

Parameterized Complexity and the Understanding, Design, and Analysis of Heuristics, May 06–11, 2013

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National Institute of Informatics (NII) Shonan workshops aspires to be an Asian "answer" to Dagstuhl. It has started just a couple of years ago and already attracted a number of interesting meetings with a large number of participants from Asia and other parts of the world. Shonan is situated in Kanagawa Prefecture, not far from Tokyo, and is easily reachable by train from Tokyo's Narita International Airport. The participants stay in an excellent hotel with a research wing of the *Shonan Village Center* dedicated the NII Shonan workshops and may have group photos with Mount Fuji in the background.

Workshop 2013-018 was organised by Gregory Gutin, Kazuo Iwama, and Dimitrios M. Thilikos. Briefly, the workshop's motivation was as follows. In the parameterized/multivariate framework, NP-hardness is just the beginning: a result about the null-parameterization. What follows is a rich dialogue between theory and practice, with the goals of:

- explaining the effectiveness of established heuristics and

- designing better heuristics in mathematically disciplined ways.

The workshop brought together researchers from both universities and industry, who were interested in exploring how a multivariate view of complexity analysis and algorithm design can lead to industrially useful algorithms in new, mathematically systematic ways.

Several talks were given:

- Faisal Abu Khzam, Practical Aspects of Fixed-Parameter Algorithms: An Implementations Viewpoint;

- Sebastian Boecker, The Matrix Representation with Flipping problem and the FlipCut heuristic;

- Sebastian Boecker, Cluster Editing in Practice;

- David Bryant, Combinatorial optimization using diversities;

- Benjamin Burton, Exploring parameterised complexity in computational topology;

- Rod Downey, What have I been doing recently in parameterized complexity;

- Patricia Evans, Inferring Haplotypes from Genotypes on a Pedigree;

- Fedor V. Fomin, Parameterized k-opt;

- Gregory Gutin, Domination Analysis of Heuristics;

- Gregory Gutin, Exponential Neighborhoods;

- Falk Hüffner, Implementing and testing fixed-parameter algorithms;

- Kazuo Iwama, Parameterized Testability;

- Daniel Lokshtanov, LP-Based Parameterized Algorithms for Separation Problems;

- Yoshio Okamoto, Efficient Enumeration of the Directed Binary Perfect Phylogenies from Incomplete Data;

- Yota Otachi, Graph Isomorphism Problem Parameterized by Width Parameters;

- Christophe Paul, Linear kernel via conflict packing – application to FAST and dense RTI problems;

- Peter Rossmanith, Implementing Courcelle's Theorem;

- Hadas Shachnai, Tractable Parameterizations for the Minimum Linear Arrangement Problem;

- Peter Shaw, Solving Hard Problems Incrementaly;

- Manuel Sorge, Some Algorithmic Challenges in Arc Routing;

- Siamak Tazari, Deconstructing Deconstructing Algorithms: From Theory to Engineering;

- Dimitrios M. Thilikos, From parameterized complexity to heuristics;

- Takeaki Uno, FPT for Scalable Mining Algorithms.

For more information, see `http://shonan.nii.ac.jp/seminar/018/`.

Photo

Photo of participants of Shonan Seminar 018, May 8, 2013