

REPORT ON ICE-TCS THEORY DAY 2018

The 14th ICE-TCS Theory Day

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The Icelandic Centre of Excellence in Theoretical Computer Science¹ (ICE-TCS) held its 14th annual Theory Day on Friday, 24 August 2018. The programme for the event is at <http://icetcs.ru.is/theory-day2018.html>.

Takeshi Tokuyama (Tohoku University, Japan) kicked off the day with a talk entitled *Deformation of Determinants and Related Combinatorics*. The talk was based on work that Takeshi did in 1986 (as a postdoctoral researcher in mathematics) and published in 1988—see https://www.jstage.jst.go.jp/article/jmath1948/40/4/40_4_671/_pdf. He referred to it as his ‘sleeping beauty’ as there has been a peak of interest in that paper only in the last ten years, as witnessed by the citation statistics for that work. Takeshi’s ‘Weyl character formula’ was even the subject of a PROMYS research project in the summer of 2013², which led to a paper, available at <https://arxiv.org/abs/1403.8139>, that generalizes that formula to the Hall-Littlewood polynomials. The talk surveyed many interesting topics and connections with alternating sign matrices, computation of Boltzmann weights, and crystal bases.

The second half of the Theory Day 2018 was devoted to three short presentations by ICE-TCS researchers devoted to research highlights from the centre. Antonis Achilleos set himself the goal of surveying two and a half years worth of research on monitorability, carried out within the framework of the TheoFoMon project³, in 15 minutes. Tigran Tonoyan presented joint work with former ICE-TCS postdoc Christian Konrad addressing the question of whether randomness helps in guessing the middle point of an on-line sequence. (Answer: It does.) Last, but not least, Christian Bean gave an overview of an ongoing project⁴ whose goal is to automate proofs of results in enumerative combinatorics. Christian presented many examples of published theorems, some of which from 2018, that can be established using their CombSpecSearcher algorithm and that were previously obtained using human ingenuity.

The Theory Day 2018 was preceded by a seminar by Tami Tamir (Efi Arazi School of Computer Science, The Interdisciplinary Center, Israel) on Thursday, 23

¹<http://icetcs.ru.is/>

²<https://www.promys.org/research/2013>

³<http://icetcs.ru.is/theofomon/>

⁴https://ulfarsson.github.io/permuta_triangle/main_page.html

August 2018. In her talk, Tami gave an excellent introduction to the main research questions in algorithmic game theory, introduced network formation games and discussed her work with Guy Avni and Orna Kupferman on automata formation games, where the goal of each player is given by a regular language rather than by simple reachability objectives. Tami focused on results presented in the paper that may be found at <https://www.cs.huji.ac.il/~ornak/publications/fossacs14a.pdf>, which were mostly of a negative nature. She concluded her informative and entertaining presentation by introducing her university, the Efi Arazi School of Computer Science and how they try to tackle the gender issues in computer science.

Overall, this was another good edition of the Theory Day at ICE-TCS. When we founded the centre on the 29th of April 2005, I had no idea that it would see so many installments of this event, that the ICE-TCS seminar series would host more than 310 talks and that we would hold top-class conferences like ICALP and LICS at Reykjavik University. I feel fortunate to have taken part in organizing all these events, to have worked with so many great colleagues in Iceland and to have met many very interesting and inspiring people along the way.

Stay tuned for the Theory Day 2019, which will most likely be held in the spring of next year.