

## **Jury Report**

### **Dutch Prize for ICT Research 2022**

The Dutch Prize for ICT Research 2022 consists of a certificate and a sculpture, as well as 50.000 euro, to be spent for research in ICT. The prize is made available by the ICT Research Platform Netherlands, in collaboration with NWO—the Dutch Research Council—and the winner is selected by the KHMW—the Koninklijke Hollandse Maatschappij der Wetenschappen. The prize is meant for a researcher, with a scientific age of at most 15 years, who has done innovative research or is responsible for a scientific breakthrough in ICT. A factor that is weighted in the selection is whether the researcher has been able to explain the obtained results in understandable ways to a larger public. The prize is meant as a tribute to this researcher and to promote ICT research.

The KHMW received nominations for seven candidates, all of which were impressive researchers that had done excellent research. The jury enjoyed reading about the research of these candidates, was impressed throughout, and found it hard to award the prize to only one of them. Yet, we have chosen a winner:

#### **dr. Jasmin Blanchette, Vrije Universiteit Amsterdam**

His research is directed to the development and application of interactive and automatic theorem provers. These are tools for proving mathematical statements with the aid of computers. They have a wide range of applications, including the verification of hardware, software and algorithms, as well as in mathematics. For safety-critical applications, a machine-checked correctness proof is a crucial tool against the possibility of catastrophic flaws due to human error.

Although the areas of interactive and automatic theorem proving employ quite different methods and techniques and have separate communities and conferences, Blanchette is an expert on both and has done excellent work in porting techniques between these fields.

Breakthrough contributions of Dr. Blanchette include his development of the tools Sledgehammer and Nitpick, which contribute fundamentally to the success of the interactive theorem prover Isabelle/HOL and are used by researchers all over the world when proving theorems. Sledgehammer incorporates some of the power of automatic theorem provers into an interactive framework, whereas Nitpick harnesses the power of SAT solvers to find counterexamples. Blanchette rightly won the 2021 test-of-time Skolem award for his work on Sledgehammer.

Blanchette and his students also created the automatic theorem prover Zipperposition, which won in both 2020 and 2021 the prestigious CADE ATP System Competition for Automated Theorem Proving.

His work yields tools to further theorem proving and touches the very foundations of this field. His team extended the most effective method for proving first-order formulas, the superposition calculus, to higher-order logic. This work was crucial for the success of the Zipperposition tool.

Dr. Blanchette contributes to the dissemination of this work through his widely used open access textbook *The Hitchhiker's Guide to Logical Verification*, through teaching at summer schools, and through appearances in the popular press.

Although less than ten years past his PhD defence, Jasmin Blanchette won several awards, and is Editor-in-Chief of the leading journal on automated reasoning. His combination of work on theory and implementation, with wide-ranging applications, and the successful dissemination of this work, convinced this jury to have chosen a worthy winner of the Dutch Price for ICT Research 2022.

*Prof. dr. R.J. (Rob) van Glabbeek, professor in computer science, in particular formal methods, University of New South Wales, Sydney, Australia*

*Prof. dr. F.A.H. (Frank) van Harmelen, professor in knowledge representation, Vrije Universiteit Amsterdam*

*Prof. dr. J.N. (Joost) Kok, dean of the faculty of Electrical Engineering, Mathematics and Computer Science, University of Twente*

The jury met on January 25, 2022 under the leadership of KHMW-director Ir. J.R. (Ronald) Prins, founder of Hunt & Hackett B.V. and co-founder and ex-CEO of Fox-IT, in the presence of Prof. dr. A.P. (Ad) IJzerman, secretary for natural sciences, KHMW, and Drs. S. (Saskia) van Manen, secretary, KHMW.