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The Presburger Award Committee, consisting of Stefano Leonardi, Andrzej Tarlecki, and Wolfgang Thomas (chair) has unanimously decided to propose

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as first recipient of the EATCS Presburger Award for young scientists. Mikolaj Bojanczyk, 32 years old, has contributed numerous deep results to automata theory and to logic and algebra in computer science.

After his undergraduate studies (1995-2000), Mikolaj Bojanczyk was a Ph.D. student at the University of Warsaw under the direction of Igor Walukiewicz (2000-2004). He spent a year as a postdoc at LIAFA in Paris (2004-2005) and is now professor extraordinarius at the University of Warsaw.

His thesis, entitled *Decidable Properties of Tree Languages*, received the Ackermann award (for Ph.D. theses) in 2005 by the European Association of Computer Science Logic. In 2006, he was awarded the *Witold Lipski prize for young Polish researchers in computer science*. In 2007, he received the Kuratowski award for young Polish mathematicians, awarded by the Polish Mathematical Society. In 2009, he became one of the very few young computer scientists to get a European Research Council Starting Grant.

In the sequel, some of his major scientific results are listed, concerning tree-walking automata, data words and data trees, forest algebras, and logics and automata involving boundedness concepts.

Tree-walking automata. Together with Thomas Colcombet, he showed that tree-walking automata cannot be determinized and do not recognize all regular tree languages. This settled a problem that had been open since 1971, when tree-walking automata were introduced by Aho and Ullman. The breakthrough result on tree-walking automata led to a number of other problems being solved, including questions on pebble automata and on the expressive power of transitive closure logic. One of the papers on tree-walking automata won the best paper award at ICALP Track B in 2004 (published in SICOMP 2008).

Data words and data trees. Together with Claire David, Anca Muscholl, Luc Segoufin and Thomas Schwentick, he proposed automata models for words and trees over infinite alphabets (also called data words and data trees). These automata can capture important logics, giving a unified framework for prior research on infinite alphabets. An important application of this research is in XML; in particular, one of his papers on data trees won the best paper award at PODS in 2006 (published in JACM 2009).

Forest algebras. Together with Igor Walukiewicz, and later with Luc Segoufin and Howard Straubing, he developed a novel algebraic theory of regular tree languages. The algebraic structure, called a forest algebra, plays the same role for trees as semigroups do for words. Several papers have shown that forest algebra is a fruitful idea, which can be used to provide elegant characterizations of existing tree logics.

Boundedness concepts in automata and logic. Starting with a single authored paper in 2004, he extended monadic second-order logic over infinite words and trees by quantifiers on the existence of finite sets of unbounded size, but preserving the decidability properties of monadic second-order logic. In further work with Thomas Colcombet and others, he developed this idea into a powerful generalized theory of logics and automata over infinite objects. He thus opened a new branch of automata theory with strong algorithmic content and great theoretical and practical potential (as documented in his invited lecture to STACS 2010).

Mikolaj Bojanczyk's publications include around 30 papers, mostly presented in prestigious conferences (ICALP, LICS, STACS, STOC). He has already been an invited speaker to at least 8 conferences and has been a PC member of at least 9 conferences since 2008 (STACS 2008, ICALP 2009, ICDT 2009, MFCS 2009, CIAA 2009, FoSSaCS 2010, ICALP 2010, PODS 2010, CSL 2010).

Mikolaj Bojanczyk's achievements make him one of the most impressive researchers in theoretical computer science in his generation. The Presburger Award Committee recommends Mikolaj Bojanczyk as an exceptional young scientist who not only fully deserves the Presburger Award but is also an ideal first recipient.

At the same time, the committee also would like to mention that more than one excellent nomination was made, a fact which lets us hope that the Presburger Award will receive several nominations of truly exceptional level from all areas of theoretical computer science in the coming years.

The Presburger Award 2010 Committee