Annales Univ. Sci. Budapest., Sect. Comp. 42 (2014) 5–8

LAUDATION TO
Professor András Benczúr
on his seventieth anniversary

by János Demetrovics and Attila Kiss

ANDRÁS BENCZÚR, professor at Eötvös L. University (ELTE) in Budapest, Hungary, was born in 1944 in Nyáregyháza, Hungary. His decision of starting his career in mathematics was inspired by his mathematics teacher, the Rácz László Prize winner Rábai Imre, at Fazekas Mihály Primary and Secondary Grammar School. After graduating in mathematics at ELTE in 1967 he wrote his dissertation for the university doctor degree under the supervision of Alfréd Rényi in probability theory. In 1978 as the scientific manager of the Institute of Computer Science and Control (SZTAKI) of the Hungarian Academy of Sciences (MTA) he completed his dissertation "Security issues in data management systems" for the candidate degree. He earned the degree of doctor of mathematical sciences in 1989. The title of dissertation was "Efficiency test model of database management systems based on Kolmogorov algorithmic information". For his outstanding research activities he received several awards including the Gyula Farkas Memorial Award (1974), the Lászó Kalmár Memorial Medal (1979), and the Academy Award of HAS (1989). For his exceptional service in higher education he was awarded by the Award for the Hungarian Higher Education (1997), by Pro Universitate Gold Medal of ELTE (2009) and by the Medal of the Faculty of Computer Science of the University of Debrecen (2010).

ANDRÁS BENCZÚR is a highly respected member of the Hungarian computer science and information technology community. His skills in model building and system approach turned his career from theoretical mathematics towards computer science, where he achieved outstanding results both in applications and in areas that require intensive mathematical research. The impact of Alfréd Rényi on how to approach information and probability theories can still be sensed in his works. Another person who had a major influence on his career was Mátyás Arató. He played an important role in turning András Benczúr's interest in the direction of computer science and its applications.

https://doi.org/10.71352/ac.42.005

The consequence of their productive collaboration is a number of joint results in statistical testing of stochastic processes and in modeling the performance of computer systems.

His most significant results in data management and information systems provide independent and original approaches to issues raised by practice. In his publications he considers specific problems and gives unique answers, fine characterizations to them, while the complex, comprehensive models developed by him are included in his dissertations. His individual models on the revolution in information technology and living in the digital world are based on deep results of information theory.

His early results achieved jointly with Mátyás Arató in statistical analysis of elementary Gauss–Markov processes are widely known and quoted. The co-written chapter of the book *Idősorok analízise* (*Analysis of time series*) published by Műszaki Könyvkiadó (Budapest) in 1986 can be considered as the completion of their joint work in this area.

He collaborated with András Krámli, József Pergel and Mátyás Arató during his work for SZTAKI and later for the Research Institute for Computer Application (SZÁMKI) of the Hungarian Central Statistical Office (KSH). Their results in testing performance of computer systems appeared in international journals, and are of special importance.

It is worth to note that he was the first in Hungary to implement a production management system based on remote data processing. The system created for the metallurgical complex Dunai Vasmű operated on a CDC-3300 computer of MTA SZTAKI from 1973 to 1978. The experience gained through building systems that ultimately exploit the contemporary potentialities and the deep critical analysis of the existing database management systems inspired him to raise and solve problems that require delicate probabilistic considerations.

After several attempts for measuring the amount of information contained in database-systems and describing the information providing capabilities of such systems he came to recognize the role the Kolmogorov-entropy. In his doctoral dissertation he provides a unified algorithm theoretical framework for his results on testing performance of database-management systems, and he points out the central role of Kolmogorov-entropy in measuring the amount of information in computer-processed data. His model provides a general framework to characterize systems that manage large, formal data, knowledge, etc. reaching far beyond the world of database management systems. Later he developed a general model of information system by enhancing his model as an extension of Shannon's communication model. By combining database-management and algorithmic information theories he defined specific models for the phenomena of data explosion and for the exponentially growing digital universe. He presented all these results in different forms and for different audience such as scientific and technical papers, international conferences, academic lectures and semi-

nars. Based on this theoretical background he has significantly contributed to the illumination of the role of computer science, information revolution and of the problems of information society.

In addition to his main results mentioned above he made major contribution to several areas including analysis of dependencies of relational data models, logical data management, machine learning and algorithm theoretical characterization of fuzzy sets. Together with his PhD students he introduced several interesting models in data modeling, and his previous models for information design were enhanced for web and document based improvements.

He earned a great reputation in higher education for his wide-ranging activity. He taught probability theory and computing courses at ELTE, Corvinus University of Budapest, Budapest University of Technology and Economics. At ELTE he was responsible for the database management and information management courses. He participated in the development of the curriculum of the two-stage education system, he is in charge of the software development MSc program at ELTE. In his educational activity he put special emphasis on keeping proper ratio between practical and theoretical training, and maintaining the material of his courses up to date. He played a leading role in developing the curriculum in his main subject, database management, in the national education system. He taught this subject as a visiting professor at the University of North Carolina, Charlotte, USA in 1992-93.

His inseminating role is clearly demonstrated by his effect on the research groups established at ELTE and at SZTAKI. Many of his students became a candidate of science under his guidance. He inspired a number of dissertations, and he continuously has PhD students. Seven of them earned PhD degree so far. He is intensively involved in the doctoral program from its beginning, since 1993. He is the Program Director, the Head of the Doctoral School of Informatics at ELTE, and member of doctoral and habilitation committees of three additional universities. He contributes to more than 20 doctoral processes annually.

Prior to his academic career he played a leading role and achieved successes in the application of computer science and in the development of large information systems, including the systems for the steel company Dunai Vasmű or for the Hungarian National Population Register. He participated as member or leader in the projects of The Hungarian Scientific Research Fund (OTKA) and of National Technical Development Committee (OMFB). As member of the management of the university he had an active role in major projects like the CERN's data grid project, the eScience Regional University Knowledge Center, the FuturIct project and the EIT ICT Labs.

His outstanding performance in various position in the university administration should also be acknowledged. He served as Dean of the Faculty of Science in the period 1997-2001, and as Head of the Department of Informa-

tion Systems for 15 years. He was elected member of the Senate and of other university boards, committees. As head of the Information Technology Committee for six years he played a decisive role in developing the information technology at the university. He has been a member of the Computer Science Committee of MTA from 1980, secretary from 1993 and he was the chair of the committee from 2000 to 2006. He has been a member of Mathematics and Computer Science Section of Committee of Scientific Qualification of MTA from 1985, and of the Doctoral Council of MTA in its first two periods. He was a reviewer of many dissertations. He was member of the Mathematical College of the Hungarian Accreditation Committee, and participated in the accreditation process as member of the visiting committee for three institutions. He was the chief editor of the Journal of Applied Mathematics (Alkalmaz. Mat. Lapok) for 10 years. He held many positions in János Bolyai Mathematical Society, and was the president of the John von Neumann Computer Society in two terms terminating in 2000. He contributed to the establishment of the national research community network, the NIIF program, and was a member of the presidency of the HUNGARNET association. As member of the advisory board he took part in the work of several foundations in talent management and high school education, including the Pázmány–Eötvös Foundation or the MATFUND Foundation, which supports the Mathematical and Physical Journal for Secondary Schools (KÖMAL). He has been the patron of the Computer Science Teachers' Annual Conference series, INFO ÉRA, for 20 years. He was the president of two International Olympiads in Informatics. His nearly 60 publications from the pre-university years were referred in more than 200 items, usually not in a digitally recorded way. Additional 32 references were made to his 96 publications. He is a member of the Editorial Board of the international journal, and was invited speaker or member of the program committees of several conferences. After returning from the United States in 1993 he was invited to be the chairman of the Catching up with European Higher Education Fund. He carried out this task with high intensity and devotion to the higher education until 1998. From July 1996 to July 1997 he was the head of the Institute of Informatics at Faculty of Informatics at ELTE and then from August 1997 until 2000, the Dean of the Faculty of Science. He founded and led the Department of Information Systems for 15 years.