Editor
Josip Musić

Recent Advances in Computer Engineering, Communications and Information Technology

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Plenary Lecture 1

Mutual Relation Among Graph Algorithms

Professor Eva Milková
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Abstract: The Theory of Graphs is a wonderful, practical discipline. Informatics has played a big part in its development, and these two fields are strongly interconnected. This can, perhaps, mainly be seen in the design of computer algorithms. On the one hand, there are many methods which can be used for solving the same problem, while on the other hand, using effective modifications of one algorithm, we can devise methods of solving various other tasks. To educate students in the area close connected with Graph Theory and Computer Science, called as Combinatorial or Discrete Optimization, it is important to make them familiar with certain algorithms in contexts to be able to get deeper into each problem and entirely understand it.
At the conference we will present a few ideas that have proved successful in teaching and learning this quite young part of mathematics. Using well-known Minimum Spanning Tree Problem we will discuss mutual relationships between classical solutions of the problem. Then we will follow from the mentioned problem to the most used searching algorithms, Breadth-First-Search and Depth-First-Search and will introduce various modifications of these problems.

Brief Biography of the Speaker: Professor Eva Milková graduated from the Charles University in Prague, Faculty of Mathematics and Physics, Czech Republic in 1978. Gradually received the following titles - master degree RNDr., doctoral degree Ph.D., associate professorship (docent) and professor.
She is a full professor at the University of Hradec Králové, Faculty of Science, and Department of Informatics. Her scientific interests include Graph Theory, Combinatorial Optimization and ICT in Education. She is a member of scientific counsels for doctoral studies and a supervisor of considerable number of doctoral students.
Her publication activity includes more than hundred contributions at international conferences and journals. She is a member of scientific program committees of prestigious international conferences and she is a member of editorial board of several international journals.
Details can be found on http://lide.uhk.cz/prf/ucitel/milkoev1/

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Plenary Lecture 2

Decision Making Based on Dempster-Shafer Theory of Evidence

Associate Professor Mohammad Abdullah-Al-Wadud
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Hankuk University of Foreign Studies
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Abstract: The available training data for different classification problems are usually imprecise and incomplete, which leads to uncertainty in classifications as traditional probability-based classifiers requires complete knowledge of priors and conditional probabilities. This requires a robust fusion framework to combine available information sources with some degree of certainty. The Dempster–Shafer theory of evidence provides a method for combining evidences from different sources without prior knowledge of their distributions. In this method, it is possible to assign probability values to sets of possibilities rather than to single events only, and it is not needed to distribute all the probability values among the events, thus modeling more naturally certain classes of problems. Dempster's rules for combination give a numerical procedure for fusing together multiple pieces of measurements from different (unreliable) observers. This talk addresses the employment of the Dempster-Shafer Theory of evidence in few practical applications.

Brief Biography of the Speaker: M. Abdullah-Al-Wadud received his B.S. degree in Computer Science and M.S. in Computer Science and Engineering from the University of Dhaka, Bangladesh in 2003 and 2004, respectively. He served as a lecturer in Faculty of Sciences and Information Technology, Daffodil International University, Bangladesh, and in Faculty of Sciences and Engineering, East West University, Bangladesh, in 2003 and 2004, respectively. In 2009, he completed his PhD in Computer Engineering from Kyung Hee University, South Korea. Since then he has been a faculty member of the Department of Industrial and Management Engineering, Hankuk University of Foreign Studies, South Korea, serving as a full-time lecturer from 2009 to 2011, an assistant professor from 2011 to 2013, and an associate professor since 2013. His research interest includes image enhancement, pattern recognition, sensor and ad hoc networks. He is author of 50 papers published in different peer reviewed international journals and conference proceedings.

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Plenary Lecture 3

Modeling/Coding of Multidimensional Digital Data

Associate Professor Bruno Carpentieri
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Abstract: State-of-the-art lossless compression schemes can often be subdivided into two distinct and independent phases, modeling and coding. The digital file is observed in a predefined order and then the modeling step is aimed at gathering information about it in the form of a probabilistic model that shall be used for coding.
Multidimensional data are widely used in many real-life applications, for example in medicine and in medical-related tasks, where multidimensional images are today one of the primary sources of information for specialists or surgeons, and also in environmental and climatological studies, where hyperspectral and multidimensional oceanographic data are used in ad-hoc analysis, etc.
In this talk we will show how to apply the modeling/coding paradigm to the compression of multidimensional digital data.

Brief Biography of the Speaker: Bruno Carpentieri received the “Laurea” degree in Computer Science from the University of Salerno, Salerno, Italy, and the M.A. and Ph.D. degrees in Computer Science from the Brandeis University, Waltham, MA, U.S.A.
Since 1991, he has been first Assistant Professor and then Associate Professor of Computer Science at the University of Salerno (Italy).
His research interests include lossless and lossy image compression, video compression and motion estimation, information hiding.
He has been, from 2002 to 2008, Associate Editor of the journal IEEE Trans. on Image Processing.
He was recently chair and organizer of the International Conference on Data Compression, Communication and Processing 2011, co-chair of the International Conference on Compression and Complexity of Sequences, and, for many years, program committee member of the IEEE Data Compression Conferente and of other international Conferences in the field.
He has been responsible for various European Commission contracts regarding image and video compression.

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Plenary Lecture 4

Machine Learning for Biomedical Knowledge-Based Systems

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Abstract: In the last years various machine learning techniques have been proposed by the researchers in order to develop efficient biomedical knowledge-based systems. Machine learning offers a robust computational intelligence methods , techniques, and algorithms that can help solving problems in a variety of medical and bioinformatics domains. This paper presents some of the machine learning approaches for developing biomedical knowledge-based systems. The paper covers the following techniques: (a) case-based reasoning; (b) intelligent data mining; (c) rough sets; (d) genetic algorithms; and (e) ontological engineering. Examples of the research performed by the author and his associates for developing knowledge-based systems for cancer, heart, brain tumor, thrombosis diseases as well as protein structure and human gene are discussed.

Brief Biography of the Speaker: Prof. Dr. Abdel-Badeeh M Salem He is a Professor of Computer Science since 1989 at Faculty of Computer and Information Sciences , Ain Shams University, Cairo, Egypt. He is a professor emeritus since October 2007 . He was a Director of Scientific Computing Center at Ain Shams University (1984-1990). His research includes intelligent computing, expert systems, biomedical informatics, and intelligent e-learning technologies. He has published around 300 papers in refereed journals and conference proceedings in these areas. He has been involved in more than 300 conferences and workshops as a plenary speaker, member of International Program Committees , workshop/invited session organizer and Session Chair. He is author and co-author of 15 Books in English and Arabic Languages.

He was one of the founders of the following events, First Egyptian Workshop on Expert Systems 1987, Int. Cairo Conference on Artificial Intelligence Applications in 1992 and Int. Conf. on Intelligent Computing and Information Systems 2002, and one of the main sustainers of annual Int. Romanian Internet Learning Workshop Project (RILW), 1997.

In addition he was Secretary of Egyptian Computer Society (1984-1990), Member of National Committee in Informatics – Academy of Scientific Research and Technology (1992-200), Member of Egyptian Committee in the Inter-Governmental Informatics Program, IIP-UNISCO, Paris (1988-1990) and Coordinator of the Annual International Conference for Statistics, Scientific Computing, and Social and Demographic Research (1983-1990). In addition he was a partner of a MEDCAMPUS Projects on Methodologies and Technologies for Distance Education in Mediterranean (1993-1995). In addition He is a Member of the Editorial Board of 50 international and national Journals in the following countries: Canada; Italy, Romania, Japan, Turkey, UK and Egypt. Also, He is member of many Int. Scientific Societies and associations in USA, UK, Switzerland, Austria, Canada and Egypt. Recently, he is the Editor-in-Chief of the International Journal of Bio-Medical Informatics and e-Health (IJBMIeH), Egyptian Computer Science Journal (ECSJ) and Associate Editor of International Journal of Applications of Fuzzy Sets and Artificial Intelligence (IJAFSAI).

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Plenary Lecture 5

Evolution to LTE Based Public Safety Networks and Services

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Abstract: Emergency services such as ambulances, fire fighters, and police that are the first responders require immediate access to a reliable network. The Public safety communication technologies have been available for decades but offered limited access to voice services. Today the need to more varied services such as voice and data as real time services comprising video, data base access and many other essential information, is crucial for saving more lives. The coming of LTE networks has provided the opportunity to offer such services, but many developments have to be undertaken to make it realizable. The 3GPP as well as researchers are actively working towards these objectives.
Many issues are identified as urgent. These are essentially with respect to Device to device (D2D) communications, and security aspects among other things. Our research work covers these issues as well as bandwidth allocation, broadcast/multicast, cooperative communications, soft frequency reuse and mobile data offloading to improve the capacity of a designated area. Network performance and QoS for Public Safety Network as well as commercial networks are part of many projects.

Brief Biography of the Speaker: Michel Kadoch (S'67, M'77, SM'04) ing, M.B.A. Ph.D. is a full professor at Ecole de technologie superieure ETS (Canada) and the director of the Master Program in engineering. He is active in research mostly in performance analysis, network management and control in wired as well as wireless networks. He is the director of the research laboratory LAGRIT at ETS. He is also an adjunct professor at Concordia University (Canada). He is presently working on Cognitive Radio, Network coding, Cross layer, and on Reliable multicast in wireless Ad hoc and Mesh networks and LTE. Professor Kadoch has published many articles and is the author of a book « Protocoles et reseaux locaux » (Edition PUQ, 2012). He is serving as a reviewer for IEEE journals and conferences and for grants for NSERC as well as track TPC for ICCCAS, WiMob. He has been involved for many years at ITU-T as a special rapporteur and with the industry namely Teleglobe Canada, CAE, and Communication Canada. He has been a consultant with Harris, Bell South, BC Tel, Concert and British Telecom UK, as well as the CTO (Commonwealth Telecommunication Organization).

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Authors Index

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