GEORGE NAGY

Electrical, Computer, and Systems Engineering
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Born July 7, 1937, Budapest, Hungary   Citizen of Canada, US permanent resident

BS   1959   McGill University, Engineering Physics
MS   1960   McGill University, Electrical Engineering
PhD   1962   Cornell University, EE (dissertation on neural nets)

Professional Career

1956-62	Electrical and machine design with consulting firms.
1963-72	Research Staff, IBM T.J. Watson Research Center, Yorktown.
1972-81	Professor and Chairman, Department of Computer Science, UNL.
1982-85	Professor, Department of Computer Science, UNL.
1985-11	Professor, Electrical, Computer, and Systems Engineering, Rensselaer, Troy, NY.
2011-	Professor Emeritus, Rensselaer Polytechnic Institute, Troy, NY.

Visiting Appointments

1962-63	also 1966, Research Associate, CSRP, Cornell University.
1967-68	Visiting Associate Professor, Université de Montreal.
1974, 76	IBM Research Center, Yorktown Heights, San Jose (summers).
1980	Bell Telephone Laboratories, Whippany (summer).
1981	Research Professor, Italian National Research Council (two months).
1982	Research Professor, INRS-Telecommunications, Montreal (six months).
1987, 91	Visiting Professor, University of Genoa (two months each).
1992, 93, 94	Visiting Professor, ISRI, University of Nevada (summers).
1992	Visiting Professor, McGill University (two months).
1998	Visiting Professor, Center for Image Analysis, Uppsala (three months)
1999	Consultant, Lucent Bell Laboratories, Murray Hill NJ (three months)
2005-06	Visiting Researcher, Inst. of Automation, Chinese Academy of Science, Beijing; IRST Trento and U. Salerno, Italy; Palo Alto Research Center, California.
2008	Lecturer, Jubilee Summer School, Indian Institute of Science, Bangalore
2012	Visiting Research Professor, Lehigh University, Bethlehem, PA

Significant Research Accomplishments

1967	OCR based on context and independent of the shape of symbols. Revived in 1987 and 1999.
1969	Early application of clustering and post-classification sampling to remote sensing.
1971	Facsimile compression method for printed text adopted by several manufacturers.
1976	Decision-tree based optical character recognition method suitable for custom design to different fonts and for rapid execution on microprocessors, (with R.G. Casey). Released as an IBM program product in 1988.
1979	Improved conversion of polygonal thematic maps to cellular form.
1984	X-Y trees for printed document segmentation (with S. Seth).
1985	Applications of relational database theory to geographic information systems.
1990	Syntactic page format analysis and electronic browsing for technical journals.
2004	Computer Assisted Visual Interactive Recognition (CAVIAR).
1994-2009	Adaptive and style-conscious classification, symbolic indirect correlation.

Current Research

Design and evaluation of automated document entry (text, tables, diagrams, maps).
Application of knowledge-based systems to digital image analysis.
Textual and graphical annotation of medical images
Classification of Chinese calligraphy
Adaptive, style-constrained and *interactive* pattern recognition.

Publications

Publications on the application of pattern recognition and image processing techniques to OCR, speech, biomedical problems, computer-aided learning, geographical information systems, solid modeling, image database, computer-aided design, and man-machine interface.

Over 70 technical articles in *Scientific American, Proceedings of the IEEE*, *Computer, Spectrum, IEEE Transactions on AU, C, GE, IPBM, IT*, *NN, PAMI, SMC*, ACM *Computing Surveys, Communications of the ACM,* and other refereed journals; 50+ book chapters; 200+ published conference papers; 60 technical reports. Complete list on
http://www.ecse.rpi.edu/homepages/nagy/

Major Survey Articles

Analog Storage Devices	1963
Pattern Recognition	1968, 971
Remote Sensing and Geographic Information Systems	1972, 1979, 1984
Computational Geometry	1979, 1999
Text Editors	1981
Optical Digitizers	1983
Image Database	1985
Optical Character Recognition	1969, 1982, 1992, 1996
Document Image Analysis	2000
Table Recognition	2001, 2006
Issues in Ground-truthing Graphic Documents	2002
Interactive Classification	2005
Table Processing	2006
Adaptative and Interactive Methods for Document Analysis	2008

Teaching

Introduction to digital computers; computer organization; data structures; computer architecture, operating systems and networks; computers & society; computer graphics; numerical analysis; linear systems for communications and control; electrical circuits, probability; remote sensing; pattern recognition; digital image processing; document image analysis; artificial intelligence; computer vision.

Supervised 23 PhD and 30 MS theses; served on 53 PhD and 35 MS graduate committees, and 14 external doctoral committees in eight countries.

Professional Service and Activity

Registered Professional Engineer (Nebraska:#E-3782);
Association for Computing Machinery; IEEE and IEEE Computer Society;
IEEE Committee on Machine Pattern Analysis (1966-1975, 1986-);
National Academy of Science Committee on Remote Sensing, Panel on Information Mgt. (1972-1976);
NASA, Chair USDA Application Test Peer Review Team (1978);
NASA, Advisory Group on Mathematical Pattern Recognition (1979-1981);
Nebraska Natural Resources Commission Data Bank, Advisor (1974-1981);
National Research Council, Panel on Computer Vision and Pattern Recognition (1985);
Board of Academic Advisors, Information Science Research Institute, UNLV (1991-95);
Session and panel Chair, program committees at international conferences and workshops;
Keynote and plenary speeches at many international symposia; "best paper" awards;
Seminars, lectures and workshops at 40+ universities and research institutions in twelve countries;
Refereed >280 scientific papers for journals and conferences;
Reviewed >100 proposals and served on review panels and site visits for NSF, NASA; NSERC, INRIA
External referee for over three dozen dissertations, promotion and tenure committees;
Consultant to Bell Laboratories, Caere, Compression Labs, GTX Corporation, Lehigh University,
        IBM, NASA, Tektronix, TransImage, Vidar Corporation, and several law firms;
Expert witness on optical character recognition.

Selected Grants and Awards

1973-74	UNL Research Council, *Computer Framework for Remote Sensing*;
1975	Conservation and Survey Division, *Geographic Data Base Managemen*;
1975-76	Nebraska Dept. of Labor, *Profile of a University Computer User Community*;
1975-77	Neb. Natural Resources Institute, *Drainage and Stream Information System*;
1977	Old West Commission, *Soil Classification Retrieval System*;
1976-78	NSF, *Mini and Micro Computer Improvement* (with S. Seth);
1976-79	UNL, *Simplification of the Man-Computer Interface*;
1978	NASA, *Generalized Mapping System*;
1981	National Research Council, Italy, *Computational Geometry*;
1982	Institut National de Recherche Scientifique, Quebec, *OCR Research*;
1982-84	NSF, *Digital Image Registration* (with W. Brogan);
1983-85	NSF, *Characterization of Interactive Performance*;
1984-87	NSF, *Effective Geometrical Algorithms*;
1985-86	NSF, *Decoding Substitution Ciphers for OCR* (with S. Seth);
1986	RADC, *Automatic Photo Interpretation* (with J.W. Modestino);
1987-89	US West, *Digitized Document Analysis*;
1987-89	NSF, *Visibility Algorithms*;
1989	NYS-CAT, *Solid Modeling*;
1988-89	ARO, *Optical Digitizer Characterization*;
1988-91	NATO, *Geometric Modeling*;
1989-91	USDE, *Document Processing for Libraries*;
1991-04	Hitachi Central Research Laboratory, *Advanced OCR Techniques*;
1992	NSERC, *Computational Geometry*;
1993-98	NORTEL-BNR-EARN, *OCR Research*;
1994	ISRI, UNLV, *OCR Performance Evaluation*;
1994-95	Elsag Bailey, Genoa, *Research on Forms Processing*;
1996-97	National Imagery and Mapping Agency, Map *Conversion*.
1997-98	Panasonic Information Technologies Laboratory, Princeton, *Document Analysis*;
2005-09	NSF, *Table Analysis for Generating Ontologies* (TANGO)
2007-10	NSF Cybertrust, *Reliable Processing of Voting Records for Trustworthy Elections*
2008-10	NSF, *Structuring, Reasoning, and Querying in a Large Medical Image Database*

George Nagy

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George Nagy received the B.Eng. and M.Eng. degrees from McGill University, and the PhD in Electrical Engineering from Cornell University in 1962 (on neural networks). For the next ten years he conducted research on various aspects of pattern recognition at the IBM T.J. Watson Research Center in Yorktown Heights. From 1972 to 1985 he was Professor of Computer Science at the University of Nebraska - Lincoln (nine years as chair), and worked on geographic information systems, remote sensing applications, computational geometry, and human-computer computer interfaces. Since 1985 he has been Professor of Computer Engineering at Rensselaer Polytechnic Institute. He has held visiting appointments at the Stanford Research Institute, Cornell, the University of Montreal, the National Scientific Research Institute of Quebec, the University of Genoa and the Italian National Research Council in Naples and Genoa, AT&T and Lucent Bell Laboratories, IBM Almaden, McGill University, Institute for Information Science Research at the University of Nevada, University of Bern, Center for Image Analysis in Uppsala, Center for Scientific and Technological Center, Trento, University of Salerno, Palo Alto Research Center, the Institute of Automation of the Chinese Academy of Science. In addition to recognition systems that improve with use, his interests include OCR, document image analysis, web-based ontologies, interactive visual recognition, geographic information systems and computational geometry, solid modeling, finite-precision spatial computation, and computer vision. He was codirector director of the ECSE DocLab and co-director with Prof. W.R. Franklin of the Computational Geometry Laboratory. He was promoted to Emeritus Professor in 2011.