2019 Fellow Newly Elevated Fellows

Ali Abdi
for contributions to wireless channel modeling and underwater communications

Karim Abed-Meraim
for contributions to blind system identification and source separation for communications

Edward Adelson
for contributions to image representation and analysis in computer vision

Sonia Aissa
for contributions to design and performance analysis of cognitive radio and cooperative communication systems

J .Stewart Aitchison
for contributions to nonlinear optical devices and point-of-care testing systems

Elad Alon
for contributions to mixed-signal integrated circuit design and methodology

Max Ammann
for contributions to compact antennas for wideband wireless applications

Leopoldo Angrisani
for contributions to test and measurement of communication systems

Yoshihiro Baba
for contributions to electromagnetic modeling of lightning

Michael Backes
for contributions to computer security and privacy

Matthias Bauer
for contributions to growth technologies for alloys for transistors

Navakanta Bhat
for contributions to electrochemical biosensors in nanoelectronic devices

William Blackwell
for contributions to atmospheric remote sensing algorithms and instrumentation

Pierre Blondy
for contributions to radio frequency micro electromechanical systems

Iustin Radu Bojoi
for contributions to control of electrical drives and power electronics

2019 Fellow Newly Elevated Fellows

Silverio Bolognani
for contributions to permanent magnet synchronous motor technology

Gabriella Bosco
for contributions to modeling and design of coherent optical communication systems

Jill M. Boyce
for contributions to video coding

Lucien Breems
for contributions to over-sampled converters using complementary metal-oxide-semiconductor technology

Olav Breinbjerg
for leadership in spherical near-field antenna measurements

Michael Bronstein
for contributions to acquisition, processing, and analysis of geometric data

Walter Buchanan
for leadership in accreditation activities of engineering technology programs

Steven Butler
for technical leadership in aerospace systems

Bruce Campbell
for contributions to radar remote sensing for planetary science

Richard Campbell
for contributions to millimeter and terahertz wafer-probe technology

Hui Cao
for contributions to spatial coherence engineering of lasers

Antonio Capone
for contributions to the design and resource management of wireless and Internet Protocol networks

Richard Carson
for contributions to quantitative positron emission tomography

Friedhelm Caspers
for contributions to charged particle accelerators

David Castañón
for contributions to discrete-time stochastic control and information fusion

2019 Fellow Newly Elevated Fellows

Mujdat Cetin
for contributions to image processing for synthetic aperture radar and sensor array

Meng-Fan Chang
for contributions to static and nonvolatile memories for embedded systems

Patrick Chapman
for application of power electronics devices and systems for solar energy conversion

Deming Chen
for contributions to field-programmable gate array high-level synthesis

Jie Chen
for contributions to optimization and control of complex systems

Jiming Chen
for contributions to resource allocation and optimization in wireless sensor networks

Xing Bi Chen
for contributions to power super-junction metal-oxide-semiconductor field-effect transistors

Zhe Chen
for contributions to power electronics for wind energy conversion

Kangguo Cheng
for contributions to fully depleted Silicon-on-Insulator Complementary Metal-Oxide Semiconductor process technology

Kin Ping Cheung
for contributions to plasma process-induced damage in integrated circuits

Pei-Yu Chiou
for contributions to optofluidics for high throughput single cell manipulation

Hyouk Ryeol Choi
for contributions to robotic interactive sensing

Jong Choi
for contributions to debugging and compilers for parallel computing

Sewan Choi
for contributions to power converter technologies

Paul Chow
for contributions to the programmability of field-programmable gate array based computing

2019 Fellow Newly Elevated Fellows

Tommy Chow
for contributions to computational intelligence techniques for control systems diagnosis

Qing-Xin Chu
for contributions to compact wideband antennas

Brian Classon
for contributions to commercial cellular system standardization

Peter Clout
for leadership in data acquisition and control in nuclear and plasma sciences

Jose Cobos
for contributions to power supply systems

Michael Condry
for leadership in the development of semiconductor and computing technologies

Jose Luis Contreras
for contributions to brain-machine interfaces and wearable exoskeletons

Kerstin Dautenhahn
for contributions to social robotics and human-robot interaction

Timothy Davidson
for contributions to optimization of signal processing and communication systems

Bart De Schutter
for contributions to optimal control of discrete-event and hybrid systems

Antonio Della Corte
for leadership in superconducting magnets

Xiaotie Deng
for contributions to computing in partial information and interactive environments

Tayeb Denidni
for contributions to frequency selective surfaces and their application to reconfigurable antennas

Santosh Devasia
for contributions to feedforward control of nonminimum-phase systems

Thomas Dionise
for contributions to mitigation of transients and harmonics in power systems

2019 Fellow Newly Elevated Fellows

Antun Domic
for technical leadership in the integrated circuits design automation

David Dorrell
for contributions to time efficient design methodology of rotating electrical machines

Robert Durham
for contributions to submersible electrical equipment analysis and multi-point ground methods in hazardous petroleum and chemical environments

Nicola Elia
for contributions to networked control systems

Christian Enz
for contributions to low-power analog circuit design

Meng Hwa Er
for contributions to electronic engineering education

Joseph Evans
for contributions to cognitive networks and deployment of defense networks

Jiyuan Fan
for leadership in applications for power distribution systems

Xuejun Fan
for contributions to the modeling and characterization of electronic packaging design

Luca Fanucci
for the contributions to the design of Very-large-scale integration systems for network-on-chip

Dejan Filipovic
for contributions to frequency-independent and wideband antennas

Robert Fish
for application of visual communications and networking

Dimitrios Fotiadis
for contributions to modelling and machine learning in biomedical data processing

Mark Fox
for contributions to constraint-directed reasoning and ontologies

Emilio Frazzoli
for contributions to motion planning and control of autonomous vehicles

2019 Fellow Newly Elevated Fellows

Emilia Fridman
for contributions to time-delay systems and sampled-data control

Yun Fu
for contributions to manifold learning and face and gesture recognition

Claudio Fuerte-Esquivel
for contributions to modeling, analysis and operation of Flexible Alternating Current Transmission Systems

Christophe Fumeaux
for contributions to resonant dielectric-loaded antennas

Alexander Gaeta
for contributions to quantum and nonlinear photonics

Jianfeng Gao
for contributions to machine learning for Web search and natural language processing

Kaizhong Gao
for contributions to data storage technologies

Shichang Gao
for contributions to low-cost pattern-reconfigurable and broadband printed antennas

Prof. Julian Gardner
for contributions to electronic noses and gas sensors

Simson Garfinkel
for contributions to digital forensics and computer security

Anne Gattiker
for contributions to integrated circuit test and diagnosis

Guido Gerig
for contributions to medical image processing

Maysam Ghovanloo
for contributions to implantable wireless integrated circuits and systems

Ali Ghrayeb
for contributions to modulation design and implementation of multiple antenna wireless systems

Bruce Gnade
for contributions to electronic materials and device technologies

2019 Fellow Newly Elevated Fellows

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Robert Greenberg
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Warren Grundfest
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A. Gutierrez Aitken
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Mor Harchol-Balter
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Hossein Hashemi
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Ahmed Hassan
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Xiaodong He
for contributions to multimodal signal processing in human language and vision technologies

Ahmed A-G Helmy
for contributions to routing protocol design and mobility modeling

Pin-Han Ho
for contributions to failure restoration in optical backbone networks

Steven Chu-Hong Hoi
for contributions to machine learning for multimedia information retrieval and scalable data analytics

Keum-Shik Hong
for contributions to adaptive estimation and brain-computer interface techniques

2019 Fellow Newly Elevated Fellows

Zeng-Guang Hou
for contributions to neural network optimization and control for rehabilitation

Gang Hua
for contributions to facial recognition in images and videos

Tingwen Huang
for contributions to dynamical analysis of neural networks

Mei-Yuh Hwang
for contributions to speech and language technology

Daniele Ielmini
for contributions to nonvolatile semiconductor memories

Syed Islam
for contributions to wind energy conversion systems

Hiroshi Ito
for contributions to high-speed photodiodes for millimeter and terahertz wave generation

Hans-Arno Jacobsen
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Nitin Jain
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Mona Jarrahi
for contributions to terahertz technology and microwave photonics

Lijun Jiang
for contributions to broadband computational electromagnetic methods

Tao Jiang
for contributions to coding, modulation, and cognitive radio systems design

Hai Jin
for contributions to peer-to-peer and cloud computing systems

Mihalo Jovanovic
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for contributions to on-chip circuit reliability evaluation and characterization

Dong In Kim
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for contributions to high-speed Vertical Cavity Surface-Emitting Lasers and optical interconnects

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for contributions to transformer engineering education

Chih-Huang Lai
for contributions to magnetic information storage and spintronic devices

Roger Lake
for contributions to quantum mechanical electronic device modeling

2019 Fellow Newly Elevated Fellows

Mark Lantz
for contributions to digital magnetic tape recording

Patrick Lecallet
for contributions to perceptual optimization of video signal processing

Jaejin Lee
for contributions to programming systems of heterogeneous machines

Juho Lee
for leadership in standardization of cellular communication technologies

Seung Jae Lee
for contributions to power distribution protection and automation

Frank Leferink
for leadership in electromagnetic compatibility measurement techniques

Chih-Peng Li
for contributions to digital broadcasting and wireless transmission

Hai Li
for contributions to neuromorphic computing systems

Hongbin Li
for contributions to adaptive radar signal processing with limited data

Qi Li
for contributions in speech signal processing and speaker authentication

Shutao Li
for contributions to image fusion and classification in remote sensing

Yonghui Li
for contributions to cooperative communications technologies

C. Steven Lingafelt
for leadership in cybersecurity education and practice

Alex Liu
for contributions to firewall design and analysis

Jinjun Liu
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2019 Fellow Newly Elevated Fellows

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Xiaoping Liu
for contributions to system identification and networked teleoperation

Xin Liu
for contributions to the design of cross-layer resource allocation algorithms for cellular and cognitive radio networks

Teng Long
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Cristina Lopes
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Marco Lops
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Anant Madabhushi
for contributions in image analysis tools for diagnosis and prognosis of diseases

Pui-In Mak
for contributions to radio-frequency and analog circuits

John Malinowski
for contributions to motor efficiency manufacturing regulations and standards

Shiwen Mao
for contributions to wireless multimedia networking

Charles Mc Shane
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Dale McMorrow
for contributions to laser-based methodologies for simulating single-event effects in digital devices

Derek McNamara
for contributions to antenna synthesis and engineering

Neelesh Mehta
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Tao Mei
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2019 Fellow Newly Elevated Fellows

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for contributions to computational methods for biological image analysis

Tim Menzies
for contributions to software engineering for artificial intelligence

Bruno Michel
for contributions to energy efficiency for computers and solar systems

Miroslav Micovic
for contributions to gallium nitride electronics

Joydeep Mitra
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Theodore Moise
for contributions to ferroelectric memory development and engineering

Sasan Mokhtari
for leadership in energy industry technology solutions

Onur Mutlu
for contributions to computer architecture research and practice

Katsufumi Nakamura
for contributions to integrated circuits for digital imaging

Jason Nieh
for contributions to virtualization, scheduling, and mobile computing

Anibal Ollero Baturone
for contributions to the development and deployment of aerial robots

Antonis Papachristodoulou
for contributions to analysis and design of networked control systems

Evangelos Papadopoulos
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Milorad Papic
for contributions to probabilistic planning methods to mitigate cascading of the bulk power system

Danilo Pau
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Yi Qian
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Stewart Rauch
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Gerhard Rigoll
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Robert Rohling
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2019 Fellow Newly Elevated Fellows

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for contributions to algebraic coding theory and cryptography

Matthew Roughan
for contributions to Internet measurement and analysis

Romit Roy Choudhury
for contributions to wireless network protocols and indoor localization

Amit Roy-Chowdhury
for contributions to video-based tracking and behavior analysis

Dan Rubenstein
for contributions to massively distributed networked systems

Stuart Rubin
for contributions to computational intelligence

Roland Ryf
for contributions to optical switching and multiplexing technology

Walid Saad
for contributions to distributed optimization in cooperative and heterogeneous wireless systems

Rajiv Sabherwal
for contributions to research on management of knowledge and information technologies

Samar Saha
for contributions to compact modeling of silicon field-effect transistors

Tapan Saha
for contributions to monitoring and assessment of power transformers

Sayeef Salahuddin
for contributions to low power electronic and spintronic devices

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Igal Sason
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2019 Fellow Newly Elevated Fellows

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Venkat Selvamanickam
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Kyuseok Shim
for contributions to scalable data mining and database query processing

Mei-Ling Shyu
for contributions to multimedia big data analytics and management

Ramesh Sitaraman
for contributions to content delivery, internet performance, and distributed systems

Mikael Skoglund
for contributions to source-channel coding and wireless communications

Dawn Song
for contributions to systems security and privacy

Lingyang Song
for contributions to cooperative communication and networking

Maarten Steinbuch
for contributions to motion control and mechatronics

Christoph Stiller
for contributions to machine vision for automated driving

Fuchun Sun
for contributions to neural network control of nonlinear systems with applications to robotic manipulators

Jonathan Sun
for contributions to spin-transfer-torque magnetic random access memory

Yan Sun
for contributions to trust modeling and statistical signal processing for cyber-physical security

Kenji Sunagawa
for contributions to cardiovascular mechanics, baroreflex dynamics, and bionic cardiology applications

Bruce Suter
for contributions to data acquisition for aerospace sensory information systems

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Jonathan Sykes
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Mario Sznaier
for contributions to identification of switched systems and multiobjective control

Joseph Tabrikian
for contributions to estimation theory and Multiple Input Multiple Output radars

Munehiro Tada
for contributions to copper interconnects for very-large-scale integration

Seishi Takamura
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HarkHoe Tan
for contributions to compound semiconductor optoelectronic materials and devices

Yap-Peng Tan
for contributions to visual data analysis and processing

Chi-Keung Tang
for contributions to interactive segmentation algorithms in computer graphics applications

Jian Tang
for contributions to optimization in wireless networks and mobile crowdsourcing systems

Meixia Tao
for contributions to resource allocation in broadband wireless networks

Jan-Ulrich Thiele
for contributions to magnetic recording

Ioannis Tomkos
for contributions to dynamic optical networks

Carme Torras
for contributions to learning algorithms for robot perception, planning and manipulation

David Torrey
for contributions to modeling, design, and control of electric machines and drives

Piero Tortoli
for contributions to ultrasound signal processing hardware and algorithms

2019 Fellow Newly Elevated Fellows

Jean-Yves Tourneret
for contributions to statistical signal and image analysis

Hon Tsang
for contributions to nonlinear silicon photonics and advanced waveguide grating couplers

Panagiotis Tsiotras
for contributions to nonlinear control of aerospace systems

Zhuowen Tu
for contributions to computer vision, medical imaging, and deep learning

Deepak Uttamchandani
for contributions to photonics-based sensing

Murat Uysal
for contributions to cooperative and diversity techniques in wireless and optical communications

Benjamin Van Roy
for contributions to reinforcement learning and approximate dynamic programming

Paul Vanoorschot
for contributions to applied cryptography and authentication

Dragica Vasileska
for contributions to computational electronics and simulation of nanoscale devices

Namrata Vaswani
for contributions to dynamic structured high-dimensional data recovery

Jelena Vuckovic
for contributions to experimental nano and quantum photonics

Jeffrey Walker
for contributions to airborne and satellite remote sensing of soil moisture

Liang Wang
for contributions to video-based human identification and motion analysis

Shuo Wang
for contributions to reduction of electromagnetic interference in electronic systems

Xiaofeng Wang
for contributions to system security and genomic privacy

2019 Fellow Newly Elevated Fellows

Yuanxun Wang
for contributions to time-varying and nonlinear electromagnetic devices and systems

Simon Warfield
for contributions to medical imaging

ShaoJun Wei
for leadership in Integrated Circuits engineering of smart cards and reconfigurable devices

John Turner Whitted
for contributions to computer graphics

Chee Wei Wong
for contributions to silicon nanophotonics

Robert Wood
for contributions to small-scale and soft robotics

Guangning Wu
for contributions to traction power supply equipment diagnostics for high-speed electrified railways

Min Wu
for contribution to control and automation for complex systems

Naiqi Wu
for contributions to discrete-event production systems

Zhaohui Wu
for contributions to intelligent service computing

Shengli Xie
for contributions to blind source separation and its applications

Eric Xing
for contributions to machine learning algorithms and systems

Zeshui Xu
for contributions to decision-making methodologies

Fan Yang
for contributions to surface electromagnetics for antennas

Ming-Hsuan Yang
for contributions to object tracking and face recognition

2019 Fellow Newly Elevated Fellows

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for contributions to perceptual modeling and processing of visual signals

Steve Yao
for leadership in opto-electronic oscillator and optical polarization devices

Hiroto Yasuura
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Minerva Yeung
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Eiichi Yoshida
for leadership in the development of modular reconfigurable robotic systems

Marwan Younis
for contributions to digital beam-forming techniques for spaceborne radar systems

Moustafa Youssef
for contributions to wireless location tracking technologies

Yizhou Yu
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Pericle Zanchetta
for contributions to the control of complex power electronics systems

Jared Zerbe
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Bao-Hui Zhang
for contributions to power system transient stability prediction

Cha Zhang
for contributions to machine learning for image and video data processing

Daqing Zhang
for contributions to context-aware mobile and pervasive systems

Liangpei Zhang
for contributions to image processing of remote sensing data

Mengjie Zhang
for contributions to evolutionary learning and optimization methodologies

2019 Fellow Newly Elevated Fellows

Ping Zhang
for leadership in theory, standardization, and application of wireless technologies

Richard Zhang
for leadership in development of power electronic converters

Yanchao Zhang
for contributions to wireless and mobile security

Yimin D. Zhang
for contributions to high-resolution direction finding and radar signal processing

Weisheng Zhao
for contributions to spintronic integrated circuit design

Lin Zhong
for contributions to the development of energy-efficient driver circuits for organic light-emitting diodes

Donghua Zhou
for contributions to reliability and maintenance of dynamic systems

Jingren Zhou
for contributions to cloud computing and query processing

Lidong Zhou
for contributions to trusted distributed computing

Qifa Zhou
for contributions to medical ultrasound transducers and multimodal imaging

Michael Zyda
for contributions to game design and networking