Columbia University
The Fu Foundation School of
Engineering and Applied Science

TWO THOUSAND ELEVEN

Celebrating Faculty Excellence

ACCLAIMING THE AWARDS, HONORS,
AND RECOGNITIONS THAT OUR FACULTY
RECEIVED DURING THE PAST YEAR

"Inspired by the scientific breakthroughs of their predecessors, our faculty continue to inspire our students throughout our classrooms and laboratories, educating them to become engineering and applied science leaders who will change the world, solving some of the most challenging issues we face today, tomorrow, and into the future."

—FENIOSKY PEÑA-MORA

Excellence

Introduction

As we approach the 150th anniversary of the School's founding in 1864, we continue to build on the scientific breakthroughs of all our exceptional professors who have served this School since its inception and whose accomplishments, like those of our current faculty, have an impact on the way we live our lives.

The School's first dean, renowned chemist Charles F. Chandler, enforced purity standards for milk and water; electrical engineering pioneer Michael I. Pupin developed devices essential to telegraphy and telephony; Edwin H. Armstrong invented FM radio; Elmer Gaden developed a method to mass produce antibiotics; and Dimitris Anastassiou developed digital compression techniques essential to the MPEG-2 patent pool. These faculty members and their contemporaries comprise the intellectual legacy of Columbia Engineering, a legacy of excellence, leadership, and impact.

Please join us in honoring the outstanding faculty cited within these pages for the recognitions they have received this past year. We are privileged to be able to honor the holders of nine new endowed chairs and are grateful to the donors who have made this possible. As we salute this year's honorees, we also acknowledge the achievements of our faculty in past years and are ready to celebrate the distinctions of our faculty in the future.

Feniosky Peña-Mora

Dean and Morris A. and Alma Schapiro Professor

Mihalis Yannakakis

Percy K. and Vida L. W. Hudson Professor of Computer Science

National Academy of Engineering

elected a member of the National Academy of Engineering for his contributions to algorithms and computational complexity

Named Professors

Dimitris Anastassiou

Charles Batchelor Professor of Electrical Engineering

Electrical Engineering

Katayun Barmak

Philips Electronics Professor of Applied Physics and Applied Mathematics

Applied Physics and Applied Mathematics

Keren Bergman

Charles Batchelor Professor of Electrical Engineering

Electrical Engineering

Shih-Fu Chang

The Richard Dicker Professor of Telecommunications

Electrical Engineering

Michael J. Collins

Vikram S. Pandit Professor of Computer Science

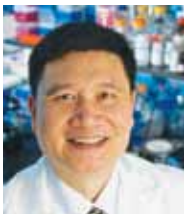
Computer Science

Named Professors

Jacob Fish

Robert A. W. and Christine S. Carleton Professor of Civil Engineering

Civil Engineering and Engineering Mechanics



Jingyue Ju

Samuel Ruben–Peter G. Viele Professor of Engineering

Chemical Engineering

Andrew Laine

Percy K. and Vida L. W. Hudson Professor of Biomedical Engineering

Biomedical Engineering

Gordana Vunjak-Novakovic

The Mikati Foundation Professor of Biomedical Engineering

Biomedical Engineering

Presidential Early Career Award for Scientists and Engineers (PECASE)

Dirk R. Englund

Assistant Professor, Electrical Engineering

Presidential Early Career Award for Scientists and Engineers (PECASE) (Department of Defense Nominee)

for his pioneering contributions to the theory and experiment of photonic nanostructures for controllable light/matter interactions at the level of single photons and single emitters, and for his development of quantum optics in semiconductor chips for applications in quantum information processing, quantum metrology, and novel optoelectronic devices and systems for optical interconnects

Faculty Early Career Development Awards

Simha Sethumadhavan

Assistant Professor, Computer Science

NSF Faculty Early Career Development Award

to support his ongoing research on techniques to build trustworthy hardware systems, even with untrustworthy, malicious hardware components

Junfeng Yang

Assistant Professor, Computer Science

NSF Faculty Early Career Development Award

to support his research on making threads more deterministic by memoizing schedules

Career Development Awards

Harish Krishnaswamy

Assistant Professor, Electrical Engineering

DARPA Young Faculty Award

to support his work on active waveguides on silicon for sub-mm wave/terahertz electronics

Ah-Hyung (Alissa) Park

Lenfest Junior Professor in Applied Climate Science, Earth and Environmental Engineering

James Lee Young Investigator Award

given by the Korean Institute of Chemical Engineers for her work in novel organic-inorganic hybrid nanomaterials for application in CO_2 capture and storage

Recognition/Achievement Awards

Guillaume Bal

Associate Professor, Applied Physics and Applied Mathematics

The Calderón Prize

given by the Inverse Problems International Association for a researcher under the age of 40 who has made distinguished contributions to the field of inverse problems broadly defined

Simon Billinge

Professor, Applied Physics and Applied Mathematics

J. D. Hanawalt Prize

awarded by the International Center for Diffraction Data for contributions to x-ray powder diffraction

Recognition/Achievement Awards

Jose H. Blanchet

Assistant Professor, Industrial Engineering and Operations Research

Erlang Prize

given by INFORMS Applied Probability Society to an outstanding probabilist under the age of 35

Shih-Fu Chang

The Richard Dicker Professor of Telecommunications, Electrical Engineering

2011 ACM SIGMM Technical Achievement Award

for outstanding technical contributions to multimedia computing, communications, and applications

Xi Chen

Associate Professor, Earth and Environmental Engineering

Sia-Nemat Nasser Award

given by the American Society of Mechanical Engineers (ASME) for research excellence in the areas of experimental, computational, and theoretical mechanics and materials

Frank DiMaggio

Robert A. W. and Christine Carleton Professor Emeritus, Civil Engineering and Engineering Mechanics

The Raymond D. Mindlin Award

given by the American Society of Civil Engineers (ASCE) for his lifetime contributions in research, teaching, and consulting in applied solid mechanics, including fluid-structure interaction, shock and vibration effects on submerged structures, and constitutive modeling of soils

Recognition/Achievement Awards

Steven K. Feiner

Professor, Computer Science

2010 Lasting Impact Award

given by the Association of Computing Machinery (ACM) User Interface Software and Technology for the 1993 paper, "Windows on the World: 2-D Windows for 3-D Augmented Reality"

Elizabeth M. Hillman

Assistant Professor, Biomedical Engineering

Adolph Lomb Medal

given by the Optical Society of America for contributions to optics by scientists under the age of 35

Julia B. Hirschberg

Professor, Computer Science

International Speech Communication Association (ISCA) Medal for Scientific Achievement

for her outstanding contributions to text-to-speech synthesis, prosody research, and many other topics in spoken language processing

Jeffrey W. Kysar

Professor, Mechanical Engineering

International Journal of Plasticity Young Researcher Award

for his impacts on the field of plasticity and on the corresponding scientific community and his citations during the last five years as measured using Scopus data

Recognition/Achievement Awards

Upmanu Lall

Alan and Carol Silberstein Professor, Earth and Environmental Engineering

The Arid Lands Hydraulic Engineering Award

given by the American Society of Civil Engineers (ASME) for his significant contributions to changing the perception and understanding of numerous topics critical to water resource management

Henning G. Schulzrinne

Julian Clarence Levi Professor, Computer Science

William Terry Award

given for lifetime distinguished service to Institute of Electrical and Electronics Engineers (IEEE) Region 1

Rene B. Testa

Professor, Civil Engineering and Engineering Mechanics

Roebling Award

given by the American Society of Civil Engineers (ASCE) for his lifetime of excellence in the structural engineering of bridges, along with advances in the state-of-the-art, and a commitment to the advancement of the structural engineering profession

Gordana Vunjak-Novakovic

The Mikati Foundation Professor, Biomedical Engineering

BioAccelerate NY Prize

for her breakthrough research for those suffering the physical and psychological scars of a damaged jaw

Recognition/Achievement Awards

Y. Lawrence Yao

Professor, Mechanical Engineering

Service Appreciation Award

given by the North American Manufacturing Research Institution for his dedicated service

Election to Professional Societies

Shih-Fu Chang

The Richard Dicker Professor of Telecommunications, Electrical Engineering

Fellow, American Association for the Advancement of Science

elected for pioneering contributions to multimedia content analysis and search

Patricia Culligan

Professor, Civil Engineering and Engineering Mechanics

Member, American Society of Civil Engineers Geo-Institute

elected to the Board of Governors of the American Society of Civil Engineers Geo-Institute

Member, National Academies Board of Earth Sciences and Resources Committee on Geological and Geotechnical EngineeringG

Election to Professional Societies

Steven K. Feiner

Professor, Computer Science

Member, Association of Computing Machinery (ACM) Special Interest Group on Computer Human Interaction (CHI) Academy

elected for extensive contributions to the study of human-computer interaction and for shaping the field

Peter R. Kinget

Professor, Electrical Engineering

Fellow, Institute of Electrical and Electronics Engineers (IEEE)

for contributions to analog and radio frequency integrated circuits

Member, Governing Board of IEEE Solid-State Circuits Society

elected to governing board of this IEEE society, which focuses on the design of integrated circuits, for 2011–2013

Andrew F. Laine

Percy K. and Vida L. W. Hudson Professor, Biomedical Engineering

Fellow, Institute of Electrical and Electronics Engineers (IEEE)

for contributions to wavelet applications in digital mammography and ultrasound image analysis

Election to Professional Societies

Helen H. Lu

Associate Professor, Biomedical Engineering

Fellow, American Institute for Medical and Biological Engineering (AIMBE)

for groundbreaking research and extraordinarily high levels of attention to mentoring in interface tissue engineering

Peter Schlosser

Vinton Professor, Earth and Environmental Engineering

Fellow, the American Association for the Advancement of Science

elected for his important scientific accomplishments in ocean and hydrological sciences

Simha Sethumadhavan

Assistant Professor, Computer Science

Associate Member, the European Computer Architecture and Compiler researchers group (HiPEAC)

first junior faculty in the U.S. to be appointed to this group

Notable Fellowships

Simon Billinge

Professor, Applied Physics and Applied Mathematics

Fulbright Research Scholar

to study spatially and temporally resolved local structure studies in advanced fundamental materials

Dirk R. Englund

Assistant Professor, Electrical Engineering

Alfred P. Sloan Research Fellowship

in recognition of and to support his work in chip-based networks for quantum optics

Helen H. Lu

Associate Professor, Biomedical Engineering

Kavli Fellow

participated in the Japanese-American Frontiers of Science Symposium that brings together the best young scientists, under age 45, to discuss advances in their fields

Latha Venkataraman

Associate Professor, Applied Physics and Applied Mathematics

Alfred P. Sloan Research Fellowship

in recognition of and to support her work in examining the interplay of physics, chemistry, and engineering at the nanometer scale and on probing, manipulation, and control of single molecules as active elements in electrical circuits

Notable Fellowships

Y. Lawrence Yao

Professor, Mechanical Engineering

Fulbright Fellowship

to collaborate on research in Spain on laser materials processing

Notable Professional Recognitions

Xi Chen

Associate Professor, Earth and Environmental Engineering

Honorary Professor, Chongqing University, China

Emanuel Derman

Professor, Industrial Engineering and Operations Research

appointed a member of the Chicago Mercantile Exchange Interest Rate Swap Risk Committee (CME IRS Risk)

Henry S. Hess

Associate Professor, Biomedical Engineering

Selectee, National Academies 2010 U.S. Frontiers of Engineering Conference

recognizing young engineers from industry, academia, and government who are performing exceptional engineering research and technical work

Notable Professional Recognitions

Lance C. Kam

Assistant Professor, Biomedical Engineering

Rising Star, Society for Physical Regulation of Biology and Medicine

delivered one of the "Rising Stars" conference lectures, titled "Rigidity Sensing by Mouse Lymphocytes"

Paul Sajda

Associate Professor, Biomedical Engineering

Editor in Chief, *IEEE Transactions on Neural Systems and Rehabilitation Engineering*

selected editor in chief of Institute of Electrical and Electronics Engineers' premier journal in neural engineering, to serve from January 2012 to January 2015

Gordana Vunjak-Novakovic

The Mikati Foundation Professor, Biomedical Engineering

Honorary Professor, University of Belgrade, Serbia

David D. Yao

Professor, Industrial Engineering and Operations Research

Honorary Professor, Xi'An Jiaotong University, China

Best Paper

Katayun Barmak

Philips Electronics Professor, Applied Physics and Applied Mathematics

Editor Selection, *Physical Review B*

for a viewpoint on "Critical Events, Entropy, and the Grain Boundary Character Distribution"

Marco J. Castaldi

Assistant Professor, Earth and Environmental Engineering

ACS Environmental Division Best Paper, in *Applied Catalysis B: Environmental*

for "Steam Reforming of Ethanol/Gasoline Mixtures: Deactivation, Regeneration and Stable Performance"

Xi Chen

Assistant Professor, Computer Science

Best Paper Award, Fourth International Frontiers of Algorithmics Workshop

for "On Tractable Exponential Sums"

Michael J. Collins

Vikram S. Pandit Professor, Computer Science

Fred Jelinek Best Paper Award, EMNLP 2010—Conference on Empirical Methods in Natural Language Processing

for "Dual Decomposition for Parsing with Non-Projective Head Automata"

Best Paper

Eitan Grinspun

Associate Professor, Computer Science

Computer Aided Geometric Design's Most Cited Paper Award, 2010

for "Discrete Quadratic Curvature Energies"

Highlighted paper, Association for Computing Machinery's Special Interest Group on Computer Graphics and Interactive Techniques

for "Asynchronous Contact Mechanics," published in *Communications of the ACM,* the journal of the Association for Computing Machinery

Hoe I. Ling

Professor, Civil Engineering and Engineering Mechanics

Best Paper, *Geotextiles and Geomembranes,* the official journal of the International Geosynthetics Society

for "Equivalent Seismic Coefficient in Geocell Retention Systems"

Shree K. Nayar

T. C. Chang Professor, Computer Science

Best Paper Award at the IEEE International Conference on Computational Photography

for "Spectral Focal Sweep: Extended Depth of Field from Chromatic Aberrations"

Best Paper

Henning G. Schulzrinne

Julian Clarence Levi Professor, Computer Science

Best Paper Award, IPTComm 2010

for "Reliability and Relay Selection in Peer-to-Peer Communication Systems"

Salvatore Stolfo

Professor, Computer Science

Best Paper Award, Insider Threat Workshop, 2010

for "Detecting Masqueraders: A Comparison of One-Class Bag-of-Words User Behavior Modeling Techniques"

Best Paper Award, Annual Computer Security Applications Conference (ACSAC), 2010

for "A Quantitative Analysis of the Insecurity of Embedded Network Devices: Results of a Wide-Area Scan"





Peter R. Kinget, *Professor of Electrical Engineering;* Ioannis Kymissis, *Assistant Professor of Electrical Engineering;* Daniel S. Rubenstein, *Associate Professor of Computer Science;* Xiaodong Wang, *Professor of Electrical Engineering;* and Gil Zussman, *Assistant Professor of Electrical Engineering*

Co-authors, Outstanding Paper on New Communication Topics, IEEE Communications Society Award

for an outstanding paper published in any Institute of Electrical and Electronics Engineers Communications Society publication in the previous 15 calendar years, for "Energy Harvesting Active Networked Tags (EnHANTs) for Ubiquitous Object Networking"

Special Recognitions

Peter N. Belhumeur

Professor, Computer Science

Named to NetExplorateur 100, list of the 100 most significant innovations of the year

for "Digital Field Guide," a digital collection of the Smithsonian's library of specimens with text and photos of plants for portable computing devices in the field

Eitan Grinspun

Associate Professor, Computer Science

One of *Popular Science*'s "Brilliant 10"

designated one of 10 "promising young researchers at labs across the nation, who represent the best of what science can achieve"

Elizabeth M. Hillman

Assistant Professor, Biomedical Engineering

Top 10 innovations of 2010

for DyCE (Dynamic Contrast Enhancement), a new optical technique for small animal imaging, recognized as a top innovation by *The Scientist,* Faculty of 1000's magazine of the life sciences

Samuel K. Sia

Associate Professor, Biomedical Engineering

One of NASA's Top 10 innovators in human health and sustainability

for development of mChip, a handheld device that takes a drop of blood and analyzes it for quick diagnosis of a variety of diseases

Special Recognitions

Cliff Stein

Professor, Industrial Engineering and Operations Research

Co-author, *Introduction to Algorithms* (MIT Press), which has sold a half million copies since its initial publication in 1990, including 15 translations by foreign publishers

Chris H. Wiggins

Associate Professor, Applied Physics and Applied Mathematics

Named as one of Business Insider's Silicon Alley 100: New York's Coolest Tech People in 2010

recognized for founding HackNY and efforts to foster engineering talent in New York City

Shree K. Nayar

T. C. Chang Professor, Computer Science

Fellow, American Academy of Arts and Sciences

elected to this prestigious academy of more than 4,000 fellows, for his research on the creation of novel vision sensors, the design of physics-based models for vision, and the development of algorithms for scene interpretation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THE
FU FOUNDATION
SCHOOL
OF
ENGINEERING
AND
APPLIED SCIENCE

"Columbia University's Fu Foundation School of Engineering and Applied Science seeks to educate socially responsible global engineering and applied science leaders whose work results in the betterment of the human condition, locally, nationally, and globally."

—MISSION STATEMENT

Excellence