ACM | Association for Computing Machinery

ANNUAL REPORT
2019
FISCAL YEAR

ACM, the Association for Computing Machinery, is an international scientific and educational organization dedicated to advancing the arts, sciences, and applications of information technology.

Letter from the President

> **"ACM's mission hinges on creating a community that encompasses *all* who work in the computing and technology arena"**

It's been quite an eventful year for ACM. While this annual exercise allows us a moment to celebrate some of the many successes and achievements the Association has realized over the past year, it is also an opportunity to focus on new and innovative ways to ensure ACM remains a vibrant global resource for the computing community.

ACM's mission hinges on creating a community that encompasses *all* who work in the computing and technology arena. This year, ACM established a new Diversity and Inclusion Council to identify ways to create environments that are welcoming to new perspectives and will attract an even broader membership from around the world. The Council is tasked with identifying best practices, devising plans-of-action, and seeking strategic partnerships to help us advance diversity, both within ACM and across the broader community.

For decades, ACM has been a leading force in keeping the computing field, policymakers, and the general public informed about the impact of technological advances. As technology advances, so do the issues faced as a society. Headlines reflect that data breaches, election compromises, and threats to privacy are occurring on a global scale. To strengthen and expand on the efforts of our existing policy committees in the U.S. and Europe, ACM has established a worldwide Technology Policy Council. TPC brings together leading policy experts to develop a global perspective on the issues and challenges posed by evolving technology.

Education has always been at the foundation of ACM, as reflected in two recent curriculum efforts. First, the ACM Task Force on Data Science issued "Computing Competencies for Undergraduate Data Science Curricula." The guidelines lay out the computing-specific competencies that should be included when other academic departments offer programs in data science at the undergraduate level. Second, building on the success of our recent guidelines for 4-year cybersecurity curricula, the ACM Committee for Computing Education in Community Colleges created a related curriculum targeted at two-year programs, "Cybersecurity Curricular Guidance for Associate-Degree Programs."

The following pages offer a sampling of the many ACM events and accomplishments that occurred over the past fiscal year, none of which would have been possible without the exhaustive efforts of our generous and energetic volunteers from around the world. ACM is grateful for your resolve and commitment.

In the coming year, there is much to do and more to explore. As I write this letter, ACM just debuted a total transformation of its Digital Library, complete with new functionality and an array of enhanced search features and tools. The move to this new platform offers members a contextualized, responsive resource providing an exceptional reading experience on a variety of devices. I wish you happy hunting in the new DL (dl.acm.org) and all the best for the year ahead.

—**Cherri M. Pancake**
ACM President,
July 2018–June 2020

Publications Portfolio

ACM's Publications Portfolio

54 Journals and Transactions

7 Magazines

31 Newsletters

Publications remain one of ACM's principle activities and pivotal lines of business. The ACM Publications Board is charged with overseeing a rich portfolio, including research journals, magazines, books, and conference/workshop proceedings (in tandem with ACM SIGs and through the International Conference Proceedings Series, ICPS). The Board also oversees publication policies, ethics and plagiarism cases, author rights as well as guides the ongoing development of the diamond of ACM's publications offerings—the ACM Digital Library.

FY19 was a fruitful year in terms of publication activities and achievements. One of the major efforts was the migration of the ACM's Digital Library from its long-standing in-house platform to Atypon's comprehensive publishing platform, Literatum. This migration offers a wide range of features, including data and code-first objects, user interface enhancements, and preprint server. In addition to reviewing the migration progress, the Publications Board continues to look forward on issues of code storage, replicability, and broader DL services. The Board played a key role in garnering community feedback from a beta version of the new DL, and those comments were taken into account during the migration phase.

In FY19, over 34,000 full-text articles were added to the Digital Library, bringing the total DL holdings to 516,000 articles. ACM's *Guide to Computing Literature* is
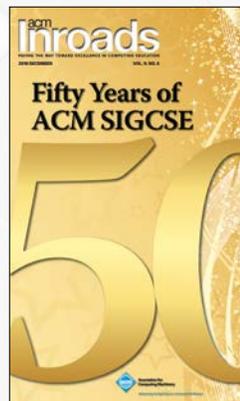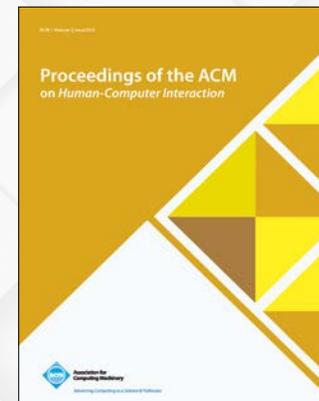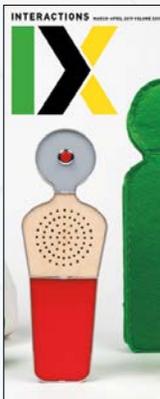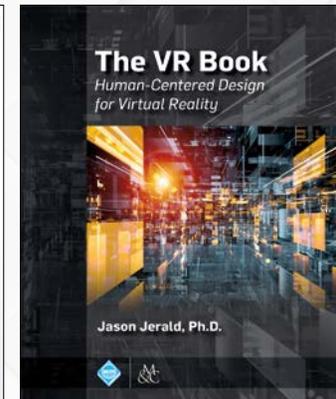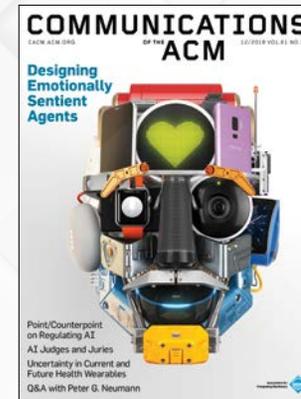
Publications Portfolio

also integrated within the DL. More than 95,000 works were added to the bibliographic database in FY19, bringing the total *Guide* coverage to more than 2.90 million works.

During the year, ACM added 671 volumes of conference and related workshop proceedings to its portfolio, including 282 volumes added to ACM's ICPS, a 14% increase over FY18.

ACM magazines continue to generate an enormous number of downloads from the ACM Digital Library. *Communications of the ACM* counted over 2.4 million article downloads. Moreover, traffic to the flagship magazine's website this year resulted in 3.6 million pageviews and 1.05 million unique users. *Ubiquity*, *eLearn*, and *Interactions* magazines also garner article annual downloads and/or website traffic in the six figures.

ACM Books, launched in 2014, continues to thrive. FY19 has seen the completion of ACM Books Collection I (25 titles) and the start of Collection II. The series published six new titles in FY19 and signed publishing agreements for six additional titles.

ACM's Publications Board also approved the *ACM Transactions in Quantum Computing* and the *ACM Transactions in Evolutionary Learning and Optimization*.
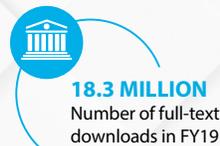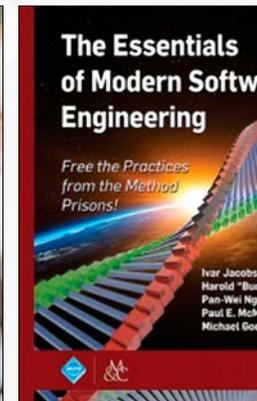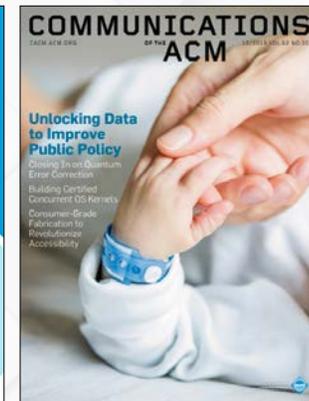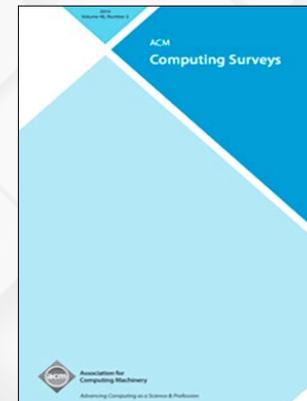
18.3 MILLION
Number of full-text downloads in FY19

30,000 WORLDWIDE
Number of individual DL subscribers

2,850 FROM 90 COUNTRIES
Number of institutional DL subscribers

6.3 MILLION FROM OVER 160 COUNTRIES
Number of DL users worldwide

Education

ACM leads the computer science education community through the work of its ACM Education Board, the ACM Education Council, ACM SIGCSE, Computer Science Teachers Association (CSTA), and ACM Education Policy Committee.

The Education Board's highly anticipated report *Retention in Computer Science Undergraduate Programs in the U.S.: Data Challenges and Promising Interventions* was released. This comprehensive study outlined the challenges and promising interventions to improve engagement and retention of all students, particularly women and underrepresented minorities.

The final draft of the curricular guidelines for the Cybersecurity Curricular Guidance for Associate Degree Programs (Cyber2yr) was released for global public comment. ABET CSAB is developing criteria for accrediting two-year programs in cybersecurity based on the Cyber2yr guidelines—a first for CSAB.

The Data Science Curriculum taskforce seeks to define what the computing/computational contributions are to the field of data science in order to provide guidance for CS or similar departments offering data science programs at the undergraduate level. In FY19, the taskforce released a first draft of computing discipline-specific competencies.

The 6th Annual ACM Conference on Learning@Scale was held in Chicago, with students representing almost 44% of the total attendees.

Amy Ko speaking at the 2019 SIGCSE Conference, a celebration of the SIG's 50th anniversary.

David Joyner presenting his work at the 2019 ACM Learning @ Scale conference.
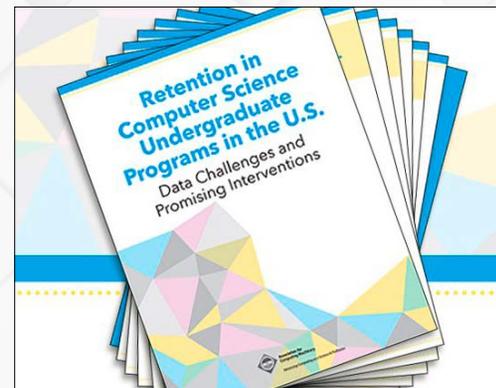
Professional Development

> "No longer does it seem possible to learn for a while, earn for a while, and then retire. Careers may extend over periods of six decades or more during which time technology will have changed society and its needs dramatically."
>
> *—Vinton G. Cerf*
> *2004 ACM A.M. Turing Award co-recipient, with Robert Kahn*

The Practitioners Board and Professional Development Committee (PDC) directed many new products and initiatives designed for computing professionals and managers. In FY19, the Board created and expanded a rich set of activities.

The PDC's successful webinar series TechTalks (formerly known as Learning Webinars) continue to be some of the most exciting programs from ACM Learning. Highlights in FY19 include talks from leaders in AI, machine learning, and deep learning. Indeed, a webinar on adversarial machine learning broke all records (both live and on demand).

Queue, ACM's bimonthly online magazine for practicing software engineers, continues to attract content from industry leaders as well as record over two million article downloads per year. In the last year, the Practitioners Board realized its promise to mount a case study program to focus on the practice of software development. As a result, three case studies were published
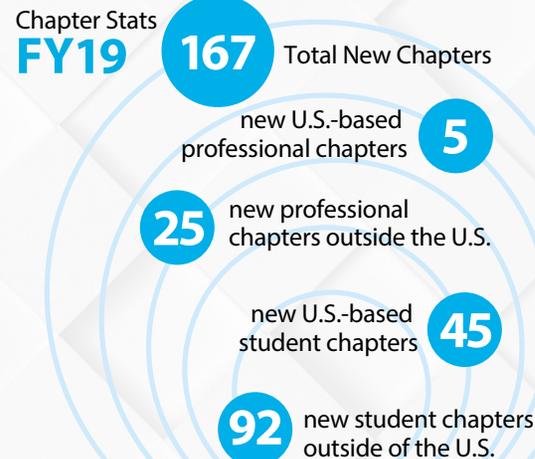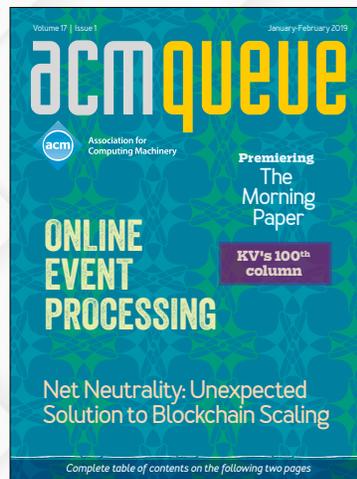
in *Queue* in FY19, with another trio under development.

FY 19 was the year ACM's Committee on Professional Ethics shared the recently updated Code of Ethics and Professional Conduct with the world. The Code was translated into Spanish and Chinese; it was presented at conferences in Poland; and board members consulted with ethics groups in Australia, Italy, New Zealand, and the U.K.

The SIGSOFT webinar series had a very busy year, producing 12 webinars on such topics as gender-inclusive software engineering, the role of programmers in the age of AI, intelligent software engineering, and successful expert software designers.

Chapter Stats FY19

167 Total New Chapters

5 new U.S.-based professional chapters

25 new professional chapters outside the U.S.

45 new U.S.-based student chapters

92 new student chapters outside of the U.S.

Public Policy

The fiscal year opened with new names for two existing policy councils and the creation of an overarching council for addressing tech policy matters on a global scale. Effective July 2018, the ACM Technology Policy Council (TPC) was chartered to set the agenda for ACM's international policy activities. The Association's U.S. Technology Policy Committee (USTPC, formerly USACM) remains the hub for ACM's interaction with U.S. government organizations, the computing community, and the public on matters of public policy and technology. EUACM, also renamed to the Europe Technology Committee (Europe TPC), continues to inform technology and computing policy issues with the European Commission and other governmental bodies in Europe, and the informatics and computing communities. Both committees will work closely with each other and with the ACM TPC to extend the impact of its work around the world.

There were many policy issues addressed by USTPC in FY19, one of the most public was the detailed statement the committee sent to the U.S. Senate with recommendations for enacting consumer privacy protections in the wake of the Facebook/Cambridge Analytica controversy. Legislators were urged to limit data collection, bar use of unlawfully collected data, and assure public understanding of how data is used, among other safeguards. In addition, USTPC's comments to the U.S. Election Assistance Commission called for a ban on all Internet connectivity in voting and voting regaled processes.

Europe TPC continues to address policy issues related to the importance of technology in boosting jobs, economic growth, competition, investment, research and development, education, inclusive social development, and innovation in the European Union. Members of Europe TPC spoke at the 40th Anniversary Conference

or Data Protection and Privacy Commissioners as well as the annual AI Summit, both held in Brussels.

The ACM Committee on Computers and Public Policy (CCPP) is celebrating its 35th year. The primary entities of CCPP include the "ACM Forum on Risks to the Public," founded in 1985 and heralded as a pioneering chronicler of potential dangers to public safety in the use of computers (https://www.acm.org/about-acm/risks-forum). A long-standing offshoot of this forum is the "Inside Risks" column that has appeared in *Communications of the ACM* since 1990.

ACM's USTPC members participated in the March 2019 Data Privacy Summit in Washington, D.C.

ACM's US Technology Policy Committee hosted Kelvin Droegemeier, director of the White House Office of Science and Technology Policy, at a recent meeting.

Students

ACM is one of the founding organizations of the Heidelberg Laureate Forum, an annual event where 200 students from around the world spend a week with preeminent scientists.

Participants of the 2018 Computing4Change competition gather at SC18 in Dallas, TX.

The 2019 ACM Student Research Competition offers a unique forum for undergraduate and graduate students to present their original research before a panel of judges and attendees at ACM conferences. This year's competition, sponsored by Microsoft, drew over 360 computer science students who presented research projects at 26 participating ACM conferences.

Undergraduate students from around the world took part in the Computing4Change Competition co-located with SC18 in Dallas, TX. The annual event, launched by SIGHPC, introduces students to the potential of computing to create positive change in our society. Students work in teams, applying data analysis and computational thinking to a social challenge while experiencing the latest tools and techniques from computing and data science.

The global phenomenon known as the Hour of Code is held every December to celebrate computer science and generate excitement among young people about programming and technology. This annual event also sparks excitement among dozens and dozens of ACM student chapters worldwide who volunteer to organize games, tutorials, and other events to inspire and demystify code in young students at local schools.

SIGOPs newly created summer school—SIGOPS Summer School on Advanced Topics in Systems—was held in August 2018 in Norway. The three-day summer, which sold out in short order, was attended by Ph.D. students, junior faculty, and engineers. The next installment is planned for 2020.

ACM SIGs continue to support student participation in ACM conferences and workshops by providing travel grants. These grants provide funding for students to help cover the cost of registration, travel and lodging for SIG-sponsored conferences. Over the last year, most SIGs increased their grant programs to extend these opportunities to more students.

News From...

ACM Europe Council

ACM Europe is a strategic player in Informatics for All, a coalition that aims to join academia, industry, government, and society together to influence education policy throughout Europe. At a workshop last March, the Rome Declaration was formulated, which called upon all European national and international institutions to "exercise their moral suasion power so that the principles of informatics are included as part of school curricula at all levels." One of the first action items was to establish a website for this cause. A first version of the site went live in May (https://www.informaticsforall.org/).

The Second ACM Europe Summer School on Data Science offered 60 young CS researchers, professionals, and Master's/Ph.D. candidates from across Europe the opportunity to spend a week in Athens developing skills, knowledge, and expertise in the area of Big Data and data science.

WomENcourage brings together women in the computing profession and related technical fields throughout Europe to exchange knowledge and experience and provide special support for women who are pursuing their academic degrees and starting their careers in computing. This year, the annual womENcourage conference was held in Belgrade, Serbia, thus expanding its presence in Eastern Europe. Moreover, nine ACM-W celebrations were held in Europe this year, ranging from community celebrations to workshops in areas such as robotics and maker activities.

The Committee of European Chapter Leaders (CECL) promotes expansion and sustainability of ACM chapters in Europe and increase ACM's visibility among young people in Europe, particularly practitioners aiming to

The 2018 womENcourage conference was held in Belgrade, Serbia.

The recent ACM Europe Summer School on HPC computer architectures for AI and dedicated applications was hosted by the Barcelona Supercomputing Center and the Universitat Politècnica de Catalunya.

attract/sustain younger people and overall members of ACM. This year CECL performed a qualitative study on a substantial amount of knowledge gleaned from regional chapters regarding their needs, best practices, and mentoring experiences.

News From...

ACM India Council

ACM India's Annual Event 2019 was held at Rajagiri School of Engineering and Technology in Kerala, India. The popular conference focuses on trends in science and technology as well as celebrates ACM's scholarly spirit and India's accomplishments in computing.

Co-located with ACM India's Annual Event is the Inter-Research-Institute Student Seminar in computer science. IRISS provides a forum for CS researchers in India to showcase their work to a conclave of fellow researchers and potential employers. IRISS 2019 was expanded to a two-day event, with a special emphasis on networking and career advice.

Microsoft Research, in partnership with ACM and the Robert Bosch Centre for Data Science and AI, hosted the fourth MSR-ACM India Academic Research Summit 2019 in Madras. The theme of this summit was data science and AI and the event drew AI researchers striving to create intelligence machines that complement human reasoning and enrich human experiences and capabilities.

CSpathshala, ACM India's national education initiative, organized the first Bebras computational thinking challenge comprised of short problems created to get young students enthused about computational thinking. The event was offered in four languages and saw participation from 1.4 million students from over 50 countries.

ACM-W India (ACM-WI) was extremely busy this year. Among the organization's activities in the region were the ACM India Summer School on Information Security and Forensics (for Women), which took place in Bengalu-ru, and the third National Level ACM Women Hackathon, and the Grace Hopper Celebration of India.

The CSpathshala education initiative teaches computer science using "unplugged" activities.

The ACM student chapter from RVR & JC College of Engineering in Guntur, India, work with young students during the 2018 Hour of Code.

News From...

ACM China Council

Established a decade ago as a thriving ACM hub, ACM China has established more than 20 city-based chapters and 10 SIG China chapters in its tenure. Among the SIGs with active China chapters are SIGCSE, SIGAI, SIGMOD, SIGCOMM, SIGMOBILE, SIGBIO, SIGMM, SIGAPP, SIGCHI, and SIGOPs, hosting many workshops and tutorials each year for practitioners and researchers in the region.

China Council's flagship event—ACM Turing Award Celebration Conference in China (ACM TURC)—took place in Chengdu last May, drawing over 1,500 ACM China members. The theme was "Interconnected, Inspired, Intelligent" and included talks from many Turing Laureates as well as some of the world's tech leaders in industry and academia.

ACM SIGCSE held the first ACM Global Computer Education Conference in China, co-located with ACM TURC, drawing over 150 attendees.
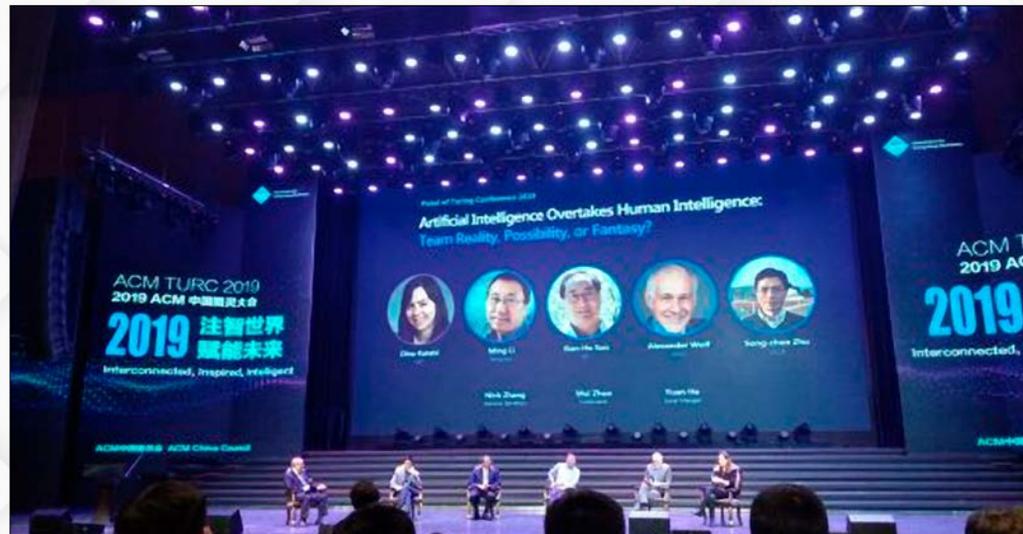
Scenes from the 2019 ACM Turing Award Celebration Conference in Chengdu, China. This annual event serves as a premiere international forum for computer research.

Conferences

ACM's Federated Computing Research Conference—held only once every four years—assembled a spectrum of 13 affiliated research conferences and workshops in Phoenix, AZ, USA last June. The FCRC model allows both a strong research focus within each represented subdiscipline of computing while also facilitating communication among researchers in different fields of computer science and engineering. This year's attendance exceeded 2,700.

ACM's Turing laureates and 200 ACM-sponsored students were on hand for the fifth annual Heidelberg Laureate Forum. This high-profile weeklong event allows selected students to meet industry icons and prestigious award recipients and to share scientific inspiration.

ACM SIGSAC celebrated its 25th anniversary with record-breaking attendance at its annual conference on computer and communications security. CCS 2018, held in Toronto, Canada, presented scientific innovations in all practical and theoretical aspects of computer security and privacy.

Students attending the 2019 Heidelberg Laureate Forum chat with ACM Turing Laureates Vinton G. Cerf (center) and Whitfield Diffie (standing).

The Experience Hall at SIGGRAPH 2018 in Vancouver, British Columbia.

The 6th ACM Rocky Mountain Celebration of Women in Computing Conference, Lakewood, CA, Nov. 2018.

Recognition

> "If we have science without humanities to help guide the political process, then we are all in trouble."
>
> **—Geoffrey Hinton**
> *Co-recipient, with Yann LeCun and Yoshua Bengio, of the 2018 ACM A.M. Turing Award*

The inaugural ACM Charles P. "Chuck" Thacker Breakthrough in Computing Award was awarded this year, recognizing individuals or groups with Thacker's out-of-the-box thinking and can-do approach to problem solving.

ACM also named 49 Distinguished Members for outstanding contributions to the computing field. These innovators have influenced a wide range of technical areas including algorithms, artificial intelligence, computer architecture, computer science education, cybersecurity, graphics, human-computer interaction, and networking.

The Distinguished Speakers Program Committee finished a stellar year, posting 150 lectures (up 9% from FY18) in 41 countries. India was the clear hotspot with 47 lectures, followed by the U.S. with 31 and the European Union with 28.

From left: ACM President Cherri Pancake, with 2018 ACM Turing Award recipients Yann LeCun, Geoffrey Hinton, Yoshua Bengio; award presenter Jeffrey Dean and ACM CEO Vicki L. Hanson

The ACM History Committee spearheaded the first workshop to preserve the histories of ACM myriad Special Interest Groups. The SIG Heritage Project will launch a website with tools and resources to provide support and training for SIG historians to document and preserve the activities, artifacts, and archives of their groups.

The ACM Fellows program recognized 56 members for their major contributions to CS, artificial intelligence, cryptography, computer architecture, high performance computing, and programming languages.

Recognition

From left, Yann LeCun, Geoffrey Hinton, and Yoshua Bengio, 2018 ACM A.M. Turing Award recipients.

ACM AWARD RECIPIENTS

2018 ACM A.M. Turing Award
Yoshua Bengio
Geoffrey Hinton
Yann LeCun

ACM Prize in Computing
Shwetak Patel

ACM Charles P. "Chuck" Thacker Breakthrough in Computing Award
Mendel Rosenblum

ACM-AAAI Allen Newell Award
Henry Kautz

Grace Murray Hopper Award
Constantinos Dashalakis
Michael J. Freedman

Software System Award
Gerald C. Combs, Wireshark

Karl V. Karlstrom Outstanding Educator Award
Robert Sedgewick

Paris Kanellakis Theory and Practice Award
Pavel Pevzner

Eugene L. Lawler Award for Humanitarian Contributions within Computer Science and Informatics
Meenaskshi Balakrishnan

Distinguished Service Award
Victor Bahl

ACM-W Athena Lecturer Award
Elisa Bertino

Outstanding Contribution to ACM Award
Chris Stephenson

2018 ACM-IEEE CS Eckert-Mauchly Award
Mark Hill

2018 ACM-IEEE CS Ken Kennedy Award
Sarita Adve

Gordon Bell Prize
Oak Ridge National Laboratory
Lawrence Berkeley National Laboratory

ACM-IEEE CS George Michel Memorial Fellowships
Linda Gesenhues
Markus Höhnerbach

SIAM–ACM Prize in Computational Science and Engineering
Jack Dongarra

IPSJ/ACM Award for Early Career Contributions to Global Research
Yasutaka Kamei

Doctoral Dissertation Award
Chelsea Finn

Honorable Mention
Ryan Beckett
Tengyu Ma

ACM India Doctoral Dissertation Award
Keerti Choudhary

Honorable Mention
Deepash Data

ACM China Doctoral Dissertation Award
Ding Wang
Wenguan Wang

ACM China Rising Star Award
Yang Yang
Haipeng Dai

ACM/CSTA Cutler-Bell Prize in High School Computing
Naveen Durvasula
Isha Puri
Eshika Saxena
Varun Shenoy

ACM COUNCIL

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SGB Council Representatives
Sarita Adve and Jeanna Neefe Matthews

Council Chairs
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ACM India: Abhiram Ranade
ACM China: Wenguang Chen
ACM-W: Jodie Tims
USACM: James Hendler
Education Board: Jane Chu Prey and Chris Stephenson
Practitioners Board: Terry J. Coatta

ACM HEADQUARTERS

Executive Director and Chief Executive Officer
Vicki L. Hanson

Deputy Executive Director and Chief Operating Officer
Patricia M. Ryan

Financial Statements

Statement of Activities: Year ended June 30, 2019 (in Thousands)

REVENUE	Without Donor Restrictions	With Donor Restrictions	Total
Membership dues	$7,176		$7,176
Publications	23,609		23,609
Conferences and other meetings	40,102		40,102
Interests and dividends	3,440		3,440
Net appreciation of investments	2,618		2,618
Contributions and grants	8,793	$613	9,406
Other revenue	817		817
Net assets released from restrictions	1,104	(1,104)	0
Total Revenue	**87,659**	**(491)**	**87,168**
EXPENSES			
Program:			
Membership processing and services	740		740
Publications	9,616		9,616
Conferences and other meetings	36,029		36,029
Program support and other	14,020		14,020*
Total Program Expenses	**60,405**		**60,405**
Support services:			
General administration	12,092		12,092*
Membership Development	1,193		1,193
Total Support Services Expenses	**13,285**		**13,285**
Total expenses	**73,690**		**73,690**
Increase (decrease) in net assets	13,969	(491)	13,478
Net assets at the beginning of the year	115,949	7,340	123,289
Net assets at the end of the year	**$129,918**	**$6,849**	**$136,767****

* Includes publications-related expenses.
** Includes SIG Fund balance of $58,652.

Financial Statements

Balance Sheet: June 30, 2019 (in Thousands)

ASSETS

Cash and cash equivalents	$38,910
Investments	124,692
Accounts receivable and other current assets	8,451
Deferred conference expenses and other assets	11,314
Fixed assets, net of accumulated depreciation and amortization	1,574
Total Assets	**$184,941**

LIABILITIES AND NET ASSETS

Liabilities:	
Accounts payable, accrued expenses, and other liabilities	$16,854
Unearned conference, membership, and subscription revenue	31,320
Total liabilities	**$48,174**
Net assets:	
Without Donor Restrictions	129,918
With Donor Restrictions	6,849
Total net assets	**136,767**
Total liabilities and net assets	**$184,941**

OPTIONAL CONTRIBUTIONS FUND — Program Expense (in thousands)

Education Board accreditation	$95
USACM Committee	20
Total expenses	**$115**

ACM's Special Interest Groups

SIGACCESS Special Interest Group on Accessibility and Computing
SIGACT Special Interest Group on Algorithms & Computation Theory
SIGAI Special Interest Group on Artificial Intelligence
SIGAPP Special Interest Group on Applied Computing
SIGARCH Special Interest Group on Computer Architecture
SIGAda Special Interest Group on Ada Programming Language
SIGBED Special Interest Group on Embedded Systems
SIGBio Special Interest Group on Bioinformatics, Computational Biology
SIGCAS Special Interest Group on Computers and Society
SIGCHI Special Interest Group on Computer-Human Interaction
SIGCOMM Special Interest Group on Data Communication
SIGCSE Special Interest Group on Computer Science Education
SIGDA Special Interest Group on Design Automation
SIGDOC Special Interest Group on Design of Communication
SIGECOM Special Interest Group on Electronic Commerce
SIGEVO Special Interest Group on Genetic and Evolutionary Computation
SIGGRAPH Special Interest Group on Computer Graphics
SIGHPC Special Interest Group on High Performance Computing
SIGIR Special Interest Group on Information Retrieval
SIGITE Special Interest Group on Information Technology Education
SIGKDD Special Interest Group on Knowledge Discovery in Data
SIGLOG Special Interest Group on Logic and Computation
SIGMETRICS Special Interest Group on Measurement and Evaluation
SIGMICRO Special Interest Group on Microarchitecture
SIGMIS Special Interest Group on Management Information Systems
SIGMM Special Interest Group on Multimedia Systems
SIGMOBILE Special Interest Group on Mobility of Systems, Users, Data and Computing
SIGMOD Special Interest Group on Management of Data
SIGOPS Special Interest Group on Operating Systems
SIGPLAN Special Interest Group on Programming Languages
SIGSAC Special Interest Group on Security, Audit and Control
SIGSAM Special Interest Group on Symbolic & Algebraic Manipulation
SIGSIM Special Interest Group on Simulation
SIGSOFT Special Interest Group on Software Engineering
SIGSPATIAL Special Interest Group on Spatial Information
SIGUCCS Special Interest Group on University & College Computing Services
SIGWEB Special Interest Group on Hypertext, Hypermedia and Web

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