

# **ACM Education Board and Education Advisory Committee FY2018-2019**

## **Executive Summary**

This report summarizes the activities of the **ACM Education Board and the Education Advisory Committee (EAC)** in FY 2018-2019 and outlines priorities for the coming year. Major accomplishments for this past year include the following:

### **Curricular Volumes:**

#### **In Progress:**

CC2020

Data Science

IT Transfer: Curriculum Guidelines for Two-Year Transfer Programs in Information Technology

Cybersecurity Curricular Guidance for Associate Degree Programs

#### **Completed:**

Curriculum Guidelines for Post-Secondary Degree Programs in Cybersecurity (CSEC2017)

Curriculum Guidelines for Baccalaureate Degree Programs in Information Technology (IT2017)

Computer Engineering Curricular Guidelines 2016 (CE2016)

Global Competency Model for Graduate Degree Programs in Information Systems (MSIS2016)

#### **International Efforts:**

Educational efforts in China

Educational efforts in India

Educational efforts in Europe/Informatics for All

#### **Taskforces and Other Projects:**

Taskforce on Education in Ethics and Computing

Taskforce to Develop Resources for Instructors to Improve Teaching and Peer Mentoring Practices

Computing for Social Good Taskforce

Retention Taskforce

Actionable Computing Enrollment and Retention (ACER) Data

NDC study

Investigating CS Disparity of Entering College Students

Learning at Scale conference

Informatics4All

## **Activities and Engagements with ACM SIGs and Other Groups:**

### **ACM Organizations**

ACM CCECC, ACM China, ACM Europe, SIGCAS, SIGCHI, SIGCSE, SIGGRAPH, SIGHPC, SIGITE, SIGPLAN, TOCE

### **Affiliated or External Groups**

AP CS Principles, AIS, AITP/EDSIG, Code.org, ABET CSAB, CSforAll, CSTA, IEEE, Informatics4All, IS2020, National Science Foundation, NCWIT, NDC Committee

### **Other Items:**

Education Board Rotation

Education Advisory Committee Rotation

### **Future Initiatives:**

Data Science report

CC2020 release

Cybersecurity Curricular Guidance for Associate Degree Programs

Transitioning *EngageCSEdu* repository to ACM e-publication

Actionable Computing Enrollment and Retention data analysis

## **Highlights**

This is a very short list of the many accomplishments of the year. For full view of the work to date, please see Section One: Summary of FY 2018-2019 Activities.

### **Retention taskforce:**

The taskforce's goals are to explore the data challenges, identify factors contributing to the leaky pipeline, and recommend potential interventions to improve retention. In December 2018, the taskforce published the report "Retention in Computer Science: Undergraduate Programs in the U.S." The report was promoted and received good attention thanks to ACM's Communications/PR team.

### **Learning at Scale Conference:**

The Learning at Scale (L@S) conference was created through the ACM Education Board in 2014. After a successful first outing, showing that there is a robust community, high-quality research, and financial viability, the meeting became an annual conference. The Sixth Annual ACM Conference on Learning @ Scale was held at the Palmer House Hilton in Chicago, Illinois on June 24-25, 2019. The conference was co-located with the 20th International Conference on Artificial Intelligence in Education (AIED 2019).

### **ACM Conferences in China:**

ACM SIGCSE successfully held the first ACM Global Computing Education Conference (CompEd) with more than 150 attendees on May 17-19, 2019, in Chengdu, China. This event was co-located with two conferences: the ACM Turing Celebration Conference – China (ACM TURC

2019) and SIGCSE China 2019. ACM-W ran a co-located workshop, and the Computing Curriculum 2020 (CC2020) group held a steering committee meeting. ACM SIGCSE China also successfully hosted the SIGCSE China Forum during the ACM Turing Conference 2019.

### **NDC Survey:**

The mission of the ACM NDC Committee is to produce the annual ACM NDC Study of Non-Doctoral Granting Programs in Computing, complementing the CRA Taulbee survey of doctoral-granting programs. The results of the 2018 survey (2018-19 NDC Study) were published in the September 2019 issue of ACM *Inroads*. The results of the review of the NCS 2016-17 data has been accepted for publication in *Inroads* and a final manuscript is being prepared.

### **Curricular Volumes:**

#### **CC2020**

Computing Curricula 2020 (CC2020) is a joint project launched by professional computing societies to examine the current state of curricular guidelines for academic programs granting degrees in computing and to provide a vision for the future of computing. The goal of the initiative is to produce a comprehensive report and an online visualization tool that compares and contrasts these guidelines to situate and contextualize them in the landscape of computing education. Ultimately, the project strives to help programs to prepare graduates both academically and professionally to meet the challenges in the 2020s. The international project team represents organizations from academia, industry, and government.

The CC2020 report is in draft form and has been reviewed by the Steering Committee. The report will be sent to the broader 33-member taskforce for their reviews before being sent at the beginning of 2020 to all the taskforce members' communities, listservs, and industry globally. The proof of concept and architecture of the visualization tool have been completed. The final report is expected October 2019 and the visualization tool by December 2019.

#### **Data Science Curriculum**

This taskforce seeks to define what the computing/computational contributions are to the new field of Data Science, in order to provide guidance for computer science or similar departments offering data science programs of study at the undergraduate level. The taskforce released a first draft of computing discipline-specific competencies for Data Science and received feedback to release the second draft during fall 2019.

#### **IT Transfer: Curriculum Guidelines for Two-Year Transfer Programs in Information Technology**

The *Information Technology Transfer Curricula 2020: Curriculum Guidelines for Two-Year Transfer Programs in Information Technology* are based on *Curriculum Guidelines for Baccalaureate Degree Programs in Information Technology* (IT2017). IT programs should prepare students with knowledge, skills, and dispositions in IT professional contexts that emphasize development of IT competencies—that is, what students know, how they demonstrate performance, and how disposed they are to apply what they know.

The main goal of the IT Transfer Curriculum is to produce a subset of the IT2017 curricular framework and guidelines that will guide how two-year colleges could structure their IT transfer programs to help prepare transfer students for successful upper division study in programs that implement the IT2017 guidance. Led by the ACM Committee for Computing Education in Community Colleges (CCECC), SIGITE participated with two members on a committee that was constituted in July 2018. A final draft was presented for feedback at the SIGITE conference, October 2019. Publication of the IT Transfer Curriculum is expected in 2020.

### **Cybersecurity Curricular Guidance for Associate Degree Programs (Cyber2yr)**

The second and final draft of the curricular guidelines for the Cybersecurity Curricular Guidance for Associate Degree Programs was released for global public comment during July 2019. The final guidelines are projected for approval during the winter of 2019. ABET CSAB is developing criteria for accrediting two-year programs in cybersecurity based on the Cyber two-year guidelines, a first for CSAB.

## **Section One - Summary of FY 2018-2019 Activities**

### **Education Board Strategic Priorities**

The following were identified as strategic objectives for the Education Board (they were later agreed to by the Education Council (now Education Advisory Committee) at its meeting in Miami in February 2011 and continue today):

- To provide a focus for ACM activity and leadership in the general area of computing education
- To support the ACM's strategic objectives through activities and initiatives in computing education; this includes providing support for ACM's various Councils
- To understand the education related needs and aspirations of ACM members—students, academics, practitioners (and their managers) and employers—and to respond appropriately on behalf of ACM
- To provide leadership for the computing community in curricular development and curricular guidance; the community is to include all levels of education (specifically including K-12 and two-year college activity) with the emphasis being on higher education
- Where possible to act on behalf of the computing community to increase the status and standing of computing education
- In recognizing ACM's role as an international organization, to understand the differing needs of the international community and to address these in Education Board and Education Advisory Committee considerations
- To organize and manage meetings of the Advisory Committee, to keep the committee members up-to-date with significant developments and generally to manage the work of the committee
- To approve ACM appointments to education-related bodies such as ABET, and to keep informed about and engage in significant related activity

### **Current priorities**

At a meeting of the Education Advisory Committee, Toronto Canada, August 2019, the following priority areas had been reviewed and will be continued, namely supporting

- Curricular guidelines (post-secondary levels: associate, baccalaureate, and masters)
- International outreach
- Retention (includes diverse groups)
- K-12 computing

## **Education Advisory Committee FY 2018-2019 Activities**

The current work of the Education Advisory Committee is detailed below by activity with task membership, current status and lessons learned. Future plans can be found in Section 2.

### **Projects & Taskforces**

#### **Learning at Scale Conference:**

ACM Education Board/Education Advisory Committee representatives: Mehran Sahami and Yan Timanovsky.

The Learning @ Scale conference was created through the ACM Education Board in 2014. After a successful first outing, showing that there is a robust community, high-quality research, and financial viability, the meeting became an annual conference. The 2019 conference was the sixth conference in this series.

#### Summary of activities:

The Sixth Annual ACM Conference on Learning @ Scale (L@S) was held at the Palmer House Hilton in Chicago, Illinois on June 24-25, 2019. The Learning @ Scale conference is underwritten by the Education Board (rather than a SIG) as the conference was originally conceptualized by the Education Board. This year the conference was co-located with the 20th International Conference on Artificial Intelligence in Education (AIED 2019). Attendance was a bit lower than past L@S conferences, with a total of 110 attendees (including 48 students) registered for L@S 2019. The lower attendance figure was likely due to the shorter planning cycle for L@S 2019, which resulted from selecting the program chairs later than usual. As a result, there was less time to advertise the call for papers and the conference more generally. Still, the number of submissions remained solid, with 70 submitted full papers, of which 24 were accepted for publication (a 34% acceptance rate). The number of submissions was around the average of prior conferences.

Overall, the 2019 conference was roughly revenue neutral. There are still some final expenses to be determined, so there is the potential for a small surplus (< \$5,000) when the figures are finalized, but most likely the conference will break even. The lower attendance revenue was offset by greater sponsorships, as sponsorship revenue came in at \$27,500, an increase over the past two years. Given surpluses from prior conferences, Learning @ Scale is projected to have a total surplus of roughly \$100,000 at this point. So, the conference still seems quite viable financially.

#### **NDC Survey:**

ACM Education Board/Education Advisory Committee representatives: Jodi Tims (Co-Chair), Stuart Zweben (Co-Chair), and Yan Timanovsky (Co-Chair).

The mission of the ACM NDC Committee is to produce the annual ACM NDC Study of Non-Doctoral Granting Programs in Computing, complementing the CRA Taulbee survey of doctoral-

granting programs. This annual survey provides data to the computing community on Degree Production, Enrollments, and Faculty from Bachelor's and Master's programs in Non-doctoral-granting Departments in Computing including demographic information by gender and ethnicity.

Summary of activities:

- Completed the report on the 2018 survey (2018-19 NDC Study). The report was published in the September 2019 issue of *Inroads*.
- Analyzed 2016-17 NCS data (from 927 institutions) on CS enrollment, graduation, and retention. Stu Zweben's submitted article has been accepted for future publication and the final manuscript is being prepared.
- Obtained 2017-18 enrollment, graduation, and retention data from NSC for all six bachelor's areas (including Cybersecurity).

### **Investigating CS Disparity of Entering College Students:**

ACM Education Board/Education Advisory Committee representatives: Tracy Camp and Beth Quinn.

We are seeing greater disparity in the CS background of students coming into higher education. How do we advise universities about this, re: equity, teaching, stratification issues? How do universities better prepare for the changes that are occurring in K-12 CS education? This project was proposed in August 2018 and launched shortly thereafter.

Summary of activities:

The initial goal of this project is to analyze existing data to understand disparity changes over time. We have learned of two potential data sources for us to investigate: HERI survey (CS specific questions re: high school experience added in 2016) and CRA data buddies project (specific questions re: high school CS experience added in 2018). We are considering whether to request a new question on the CRA data buddies survey.

### **Retention Taskforce:**

ACM Education Board/Education Advisory Committee representatives: Chris Stephenson (co-chair), Alison Derbenwick Miller (co-chair), Tracy Camp, and Stuart Zweben.

Taskforce members: Christine Alvarado, Lecia Barker, Valerie Barr, Carol Frieze, Colleen Lewis, Erin Cannon Mindell, Lee Limbird, Debra Richardson, Mehran Sahami, Elsa Villa, and Henry Walker.

The focus and original mandate of this committee was to examine and address the current issue of retention in 4-year, post-secondary CS education programs, specifically of the retention of women and URM students following CS1 and CS2 (where the pipeline is most leaky). The committee's goals are to explore the data challenges, identify factors contributing to the leaky pipeline, and recommend potential interventions to improve retention.

Summary of activities:

In December 2018, the ACM Retention Committee published the report “Retention in Computer Science: Undergraduate Programs in the U.S.” The report was promoted and received good attention thanks to ACM’s Communications/PR team. Notice was sent to the SIGCSE distribution list, with hard copies sent to interested 3rd parties. In total, 500 copies were printed. A session was held at SIGCSE 2019 with speakers Christine Alvarado (UCSD), Mehran Sahami (Stanford), Elsa Villa (UTEP), and Stuart Zweben (Ohio State University).

After the report was published, Chris Stephenson and Alison Derbenwick Miller concluded their term as chairs. Subsequently, Stu Zweben and Erin Mindell Cannon (Google) took over leadership and reconstituted this task force to continue work on retention with data from the National Student Clearinghouse (NSC).

Since February 2019, the reconstituted group submitted a proposal that was accepted to the Grace Hopper Conference (GHC 2019). On October 4, 2019, Colleen Lewis chaired the panel and Tracy Camp, Debra Richardson, and Stu Zweben were the other panelists. The focus is on using results of the Stephenson-Miller-led committee’s retention report (data, case studies, interventions) to recommend future courses of action.

The other significant activity is the collection of retention data via the NSC. Stu Zweben has analyzed 2016-17 CS bachelor’s data as prototype and baseline and submitted an article to Inroads based on that analysis. The article is currently under review. Stu has also obtained 2017-18 data for all six bachelor’s areas and 3 associate’s areas (CS, IT, Cyber).

### **Computing for Social Good Taskforce:**

ACM Education Board/Education Advisory Committee representative: Mikey Goldweber (chair).  
Taskforce members: Alison Clear, Judith Gal-Ezer, Lisa Kaczmarczyk, and Rick Blumenthal.

The goal of this taskforce is to elevate the message that computing curricula should focus, at least in part, on how computing can play an important part in helping to solve the issues of the day. This task force came into being at the August 2019 EAC meeting.

Summary of activities:

- The first goal of the taskforce was to write a proposal for a Special Session to be held at the SIGCSE Technical Symposium in March of 2020. The proposal has been accepted for presentation.

### **Taskforce on Education in Ethics and Computing:**

ACM Education Board/Education Advisory Committee representative: Bobby Schnabel (chair).  
Taskforce members: Jake Baskin, Tom Cortina, Amy Ko, Mehran Sahami, and R.Venkatesh.

This task force was formed in August 2018. It has the broad charter of undertaking activities that help the ACM community in conducting education in ethics and computing. This potentially includes collecting materials that are useful in education on this topic and making them available, bringing together existing activities and resources on this topic, and publicizing this topic to ACM members and the computing community.

Summary of activities:

- In the initial year, the task force discussed the scope of its work leading to the description given above. It also spent time assessing what is currently available, leading to the understanding that there has been very little work done so far on creating a taxonomy of topics in ethics and computing or in collecting materials.
- Task force members had conversations with people who are engaged in efforts in these regards to understand the current state. We also engaged with the organizers of the Responsible Computer Science Challenge to discuss how to collaborate.

### **Taskforce to Develop Resources for Instructors to Improve Teaching and Peer Mentoring Practices:**

ACM Education Board/Education Advisory Committee representative: Briana Morrison (chair).

Taskforce members: Jake Baskin, Michelle Craig, Leigh Ann DeLyser, Andrew Petersen, and Beth Quinn.

This task force was created to help to locate, vet, and develop as needed two distinct sets of materials: Resources to Improve Teaching and Resources for Peer Mentoring.

Summary of activities:

- To date, the task force has concentrated on the first set of materials and has identified *EngageCSEdu* ([www.engage-csedu.org](http://www.engage-csedu.org)) as a vehicle/platform for collecting vetted instructional materials that utilize an Engagement Practice to broaden participation in computing. Efforts are underway to convert *EngageCSEdu* from an NCWIT project to an ACM Publication. Having published submissions recognized as journal-equivalent entries on a CV will incentivize teaching faculty to submit and share their scholarship output, teaching materials. Allowing the materials to continue to be open-access will ensure the maximum usage by other faculty at the university and the community college and even high school level.

## **International Education Efforts:**

### **Educational efforts in China**

ACM Education Board/Education Advisory Committee representative: Ming Zhang.

SIGCSE China was established in November 2016. The purpose is to bridge the gap between the Chinese and global computing societies, develop the world's cutting-edge computer education scientific research in China with international impacts, and create more opportunities for collaboration among vigorous computing educators. There are 587 members.

Summary of activities:

- ACM China SIGCSE Chapter held a workshop on research and outlook for computer education project on February 27-March 2, in Minneapolis, MN, USA at the 50th ACM Technical Symposium on Computer Science Education (SIGCSE 2019).
- The 2019 International Workshop on Computer Science Education (IWCSE 2019) was held in Changsha on May 12, 2019, which was organized by ACM Changsha, ACM SIGCSE China Chapter.
- ACM SIGCSE successfully held the first ACM Global Computing Education Conference (CompEd) on May 17-19, 2019, in Chengdu, China, co-located with two conferences, the ACM Turing Celebration Conference – China (ACM TURC 2019) and SIGCSE China 2019. ACM-W ran a co-located workshop, and the Computing Curriculum 2020 (CC2020) group held a steering committee meeting. CompEd had more than 150 attendees.
- ACM SIGCSE China successfully hosted the SIGCSE China Forum during the ACM Turing Conference 2019. The SIGCSE China Forum was held on May 18 and 19, 2019.
- The bluebook on Computer Education and Sustainable Competitiveness is included in the ACM/EECC2020 International Computing Discipline Standard.
- The Chinese version of IT2017 was translated by Ming Zhang, Peking University; Bo Li, Xi'an Jiaotong University; Wenjun Wu, Beihang University; Xi Wu, and Shuang Zhou, Chengdu University of Information Technology.

### **Educational Efforts in India**

ACM Education Board/Education Advisory Committee representative: R. Venkatesh.

The committee has continued its focus on contributing to undergraduate curriculum development, teaching subjects, and bringing computing to schools. Last year we started summer schools on specific areas, aimed at encouraging students to undertake research in those areas. This year we also organized five summer schools. We have been holding regular workshops on teaching programming, setting exam papers and evaluation, and curriculum. *CSPathshala* has reached more than 750 schools and more importantly our recommended curriculum has been adopted by government run schools.

### Summary of activities:

- The committee started a national education initiative, *CSPathshala* in 2016. The initiative continues to break new ground. Starting with 15 pilot schools in 2016-17, over 300,000 students from 750 schools in 11 states are piloting the *CSPathshala* curriculum. Two-thirds of these schools are government schools located in rural and tribal areas. 77 awareness workshops and training programs have been conducted to date reaching 4,258 educators from 2,093 institutes.
- Tamil Nadu SCERT (a state level education body) has included a subset of the curriculum into its revised Mathematics curriculum. This subset is being taught in more than 10,000 schools. Cambridge University Press has published books as a derivative of *CSPathshala* teaching aids which will significantly increase the reach. The number of volunteers continues to grow with people stepping forward to contribute. Partnerships with Rotary Club of Pimpri, Teachers of India and CodeChef are helping us bring more organizations into the initiative.
- *CSPathshala* organized the first Bebras computational thinking challenge in India from November 19-30, 2018. This challenge is organized in over 50 countries and is comprised of short problems that are created to get students excited about computational thinking. Solving these problems require logical thinking but no prior knowledge of computing. Indian Bebras was offered in four languages and reached 1,37,000 students. It was heartening to see students from tribal schools in Andhra Pradesh achieve national ranks!
- The 1st CTiS (Computational Thinking in Schools) conference provided a platform for teachers to share experiences and resources as well as interact with computer scientists. A total of 55 abstracts were received from 11 states.
- ACM-India started 2- and 3-week summer schools in 2017 to inculcate to students, problem solving as a skill, and to introduce them to recent developments in computer science. The following five workshops were held in 2018:
  - 1) Fundamentals of Cryptology Research at Indian Statistical Institute, Kolkata during June 4-22, 2018.
  - 2) School on Data Sciences at University of Goa, Goa during June 4-16, 2018.
  - 3) School on Information Security and Forensic Sciences at PES University, Bengaluru during June 11-29, 2018, targeted at women.
  - 4) School on Programming Languages: Principles and Practice from June 4 to 23, 2018 at Pimpri-Chinchwad College of Engineering, Pune.
  - 5) School on Graph theory and Graph Algorithms at PSG College of Technology, Coimbatore from May 21st to June 8th, 2018.
- ACM India organized COMPUTE 2018, an International Symposium held from October 12 to 14, 2018, in collaboration with Chitkara University, Punjab. The three-day conference was attended by over 350 delegates including ACM India Council Members, ACM India chapter representatives, and students and faculty of many institutions.

## **Educational Efforts in Europe: Informatics for All**

ACM Education Board/Education Advisory Committee representatives: Andrew McGettrick and Judith Gal-Ezer.

Informatics for All is a Coalition involving ACM Europe, the Council of European Professional Informatics Societies (CEPIS) and Informatics Europe. The Coalition is managed by a Steering Group chaired by Wendy Hall and members Judith Gal-Ezer and Andrew McGettrick from ACM Europe, Gerald Futschek and Austeja Trinkunaite from CEPIS, and Michael Caspersen and Enrico Nardelli from Informatics Europe. (Enrico is currently President of Informatics Europe.) This group also benefits from the support of Bobby Schnabel who acts as an Advisor.

Summary of activities:

One of the main tasks undertaken by the Coalition was making arrangements for, and then running, a major workshop on 20th February 2019 in Brussels. There were 50 attendees from across Europe and all with a serious interest in Informatics education. The workshop took the form of a number of presentations from Denmark, France, Germany, Israel, Poland, Portugal, the UK and the US to set the scene. This was followed by interactive group activity aimed at producing an Action Plan to be used in charting the way ahead for the Coalition. The workshop was a considerable success. Artifacts produced included a report and an Action Plan. As of May 2019, there is a newly constructed Informatics for All web site at:

<https://www.informaticsforall.org/>. It has been funded equally by the members of the Coalition. The report of the Brussels Workshop and the Action Plan are available on this site.

Following the workshop, a face-to-face meeting took place at the end of March in Rome around the time of the ACM Europe Council meeting. The primary artifact of this meeting the Rome declaration. This declaration called upon all European national and international institutions to exercise their moral suasion power to ensure that the principles of Informatics are included as part of school curricula at all levels. It also calls for appropriate levels of funding to be made available essentially to support the aims of Informatics for All. The complete declaration is available at <https://www.informaticsforall.org/declaration>. This site is intended to attract the attention of others who might sign up as supporters of the declaration. To date (October 2019) 10 signatories have been obtained.

An article on Informatics for All entitled 'Informatics as a Fundamental Discipline for the 21st Century' appeared in the April 2019 issue of the *Communications of the ACM*, the issue showcasing European activity and achievement.

Some recent activity has involved:

- Making contact with the EU who invited members of the Coalition to a meeting in Brussels on 24th September 2019
- Related workshops have been held in Israel and in Vienna
- An additional workshop has been planned for Italy in February of 2020

## **Curricular Efforts:**

### CC2020

ACM Education Board/Education Advisory Committee representatives: Alison Clear

Project members: Alison Clear, John Impagliazzo, Shingo Takada, Ming Zhang, Abhijat Vichare, Allen Parrish, Steve Frezza, Arnold Pears, Pearl Wang, Ernesto Cuadros, Heiki Topi, Las Waguespack, and Gerrit van der Veer. Computing Curricula 2020 (CC2020) is a joint project launched by professional computing societies to examine the current state of curricular guidelines for academic programs granting degrees in computing and to provide a vision for the future of computing. The goal of the initiative is to produce a comprehensive report and an online visualization tool that compares and contrasts these guidelines to situate and contextualize them in the landscape of computing education. Ultimately, the project strives to help programs prepare graduates both academically and professionally to meet the challenges in the 2020s. The international project team represents organizations from academia, industry, and government.

The principal project sponsors are the Association for Computing Machinery (ACM) and the IEEE Computer Society (IEEE-CS) with additional sponsorship from Association for Information Systems (AIS), and Association for Information Technology Professionals (AITP/EDSIG). The project collaborators include Special Interest Group for Computer Human Interaction (SIGCHI). There is also a 33-member taskforce representing a further eight countries, making a global coverage of 13 countries.

The Steering Committee commenced their work in March 2017 with a survey of the current status of the curricular. We then planned a three-year project which would include a report and visualization tools to reflect the combination of all the areas of computing, concentrating on the ACM/IEEE-CS approved curricular.

The CC2020 report is in draft form and has been reviewed by the Steering Committee. The report will now be sent to the broader 33-member taskforce for their reviews before being sent (at the beginning of 2020) to all the taskforce members' communities, listservs, and industry globally. The proof of concept and architecture of the visualization tool have been completed. The completed report is scheduled for completion by October 2020, and the visualization tools by the end of 2020.

### Data Science Taskforce

ACM Education Board/Education Advisory Committee representatives: Andrea Danyluk and Paul Leidig, Co-Chairs.

Taskforce members: Lillian (Boots) Cassel, Andrew McGettrick, David Culler, Hongzhi Wang, Christian Servin, and Scott Buck.

At the August 2017 ACM Education Council meeting, a taskforce was initiated to add to the broad, interdisciplinary conversation on data science, with an articulation of the role of

computing discipline- specific contributions to this emerging field. Specifically, the taskforce is seeking to define what the computing/computational contributions are to this new field, in order to provide guidance for computer science or similar departments offering data science programs of study at the undergraduate level. The taskforce began its work in February 2018, released a first draft for comment in January 2019, and is now in the process of preparing a second draft for release this fall.

Summary of activities:

- January 2019
  - Released first draft of computing discipline-specific competencies for Data Science. <http://www.cs.williams.edu/~andrea/DSTF/index.html>
  - Presentation at EAAI (Educational Advances in AI) and poster session at AAAI, Honolulu, HI (Danyluk, Buck)
- February 2019
  - Curriculum draft announced to SIGCSE mailing list
  - F2f meeting of taskforce prior to SIGCSE, Minneapolis, MN
  - Special Session at SIGCSE (Cassel, Danyluk, Leidig, Servin)
  - Participated in BoF at SIGCSE (Building Bridges for Data Science Education, organized by Mine Cetinkaya-Rundel, Duke University)
- March 2019
  - Comment period formally ended on 3/31 (comment link is still live)
  - Knowledge Area reorganization; formation of working groups to include participation from outside the taskforce
- May 2019
  - Presentation at Conference Board of the Mathematical Sciences (Danyluk, Rebecca Nugent, CMU, co-author of National Academies report on Data Science)
  - Panel presentation at CompEd, Chengdu, China (Wang)
- June 2019
  - Participation in ACM Data Science Summit, San Francisco, CA (Leidig)
- July 2019
  - Participation in ITiCSE Working Group on Data Science Education (McGettrick)
- August 2019
  - Panel presentation at Joint Statistical Meetings, Denver, CO (Danyluk)
  - F2f meeting of taskforce prior to EAC meeting in Toronto
- Taskforce conference calls; working group conference calls
- Second draft report in progress with plans to release it in Fall 2019

IT Transfer: Curriculum Guidelines for Two-Year Transfer Programs in Information Technology  
ACM Education Board/Education Advisory Committee representatives: Cara Tang and Mihaela Sabin.

*The Information Technology Transfer Curricula 2020: Curriculum Guidelines for Two-Year Transfer Programs in Information Technology* are based on *Curriculum Guidelines for*

*Baccalaureate Degree Programs in Information Technology (IT2017)*. IT programs should prepare students with knowledge, skills, and dispositions in IT professional contexts that emphasize development of IT competencies—that is, what students know, how they demonstrate performance, and how disposed they are to apply what they know.

The main goal of the IT Transfer Curriculum is to produce a subset of the IT2017 curricular framework and guidelines that will guide how two-year colleges could structure their IT transfer programs to help prepare transfer students for successful upper division study in programs that implement the IT2017 guidance. Led by the ACM Committee for Computing Education in Community Colleges (CCECC), SIGITE participated with two members on a committee that was constituted in July 2018. A final draft was presented for feedback at the SIGITE conference, October 2019. Publication of the IT Transfer Curriculum is expected in 2020.

#### Cybersecurity Curricular Guidance for Associate Degree Programs

The second and final draft of the curricular guidelines for the *Cybersecurity Curricular Guidance for Associate Degree Programs* was released for global public comment during July 2019. The final guidelines are projected for approval during the winter of 2019. ABET CSAB is developing criteria for accrediting two-year programs in cybersecurity based on the Cyber two-year guidelines, a first for CSAB.

### **SIGs and Other Organizations Reports:**

#### **SIGCAS**

ACM Education Board/Education Advisory Committee representative: Mikey Goldweber.

Summary of activities:

- In March 2019 the SIG held a number of events in conjunction with the annual SIGCSE Technical Symposium. There were two half-day morning events: one focusing on Computing for the Social Good (CSG-Ed) in Education and one focusing on Incorporating the use of Humanitarian Free Open Source Software (HFOSS) projects into the classroom. There was also a one half-day afternoon event focusing on the newly revised ACM Code of Ethics and how CS instructors can make use of it in the classroom.
- Computing for Social Good Education (CSG-Ed). How to get the word out to as many educators as possible? Pre-symposia events at SIGCSE is one such venue. Workshops at regional conferences are being considered, but funding is an issue. Additionally, this community has been focusing on explanatory publications that reach a wide audience (e.g. Inroads, CACM).
- Humanitarian Free and Open Source Software (HFOSS). The HFOSS community is a specialized approach to CSG-Ed. The SIGCAS HFOSS "champions" are facing the same issues as the CSG-Ed group is as a whole. For both groups there is interest in learning

how to create their own assignments/projects but folks would rather tap into already developed projects. In other words: the repository problem.

- Ethics (w/COPE). FY19 was a big year for this area due to the publication of the revised ACM Code of Ethics.
- Social Media. SIGCAS runs an active social media presence (primarily Twitter) focusing on ethics in our digital world.
- SIGCAS Newsletter. A new EIC was appointed this summer. Our new EIC (who has an education background) wishes to focus the newsletter more on education so at least one edition per year will be reserved for SIGCAS educational activities.

## **SIGCHI**

ACM Education Board/Education Advisory Committee representative: Olivier St-Cyr.

The Human-Computer Interaction (HCI) Community of Practice is a group of educators and industry partners interested in advancing and promoting HCI Education. The community currently lives on Facebook: <https://www.facebook.com/groups/HCI.Education>. It has 217 members as of August 2019.

Summary of activities:

- The HCI Living Curriculum project aims to create a “living curriculum” focused on community connection, resource sharing, case studies, and showcasing and developing HCI principles and approaches in emerging technology domains. This is in continuation of work started by Elizabeth Churchill, Jennifer Preece, and Anne Bowser between 2011 and 2014. More details can be found at: <https://interactions.acm.org/archive/view/september-october-2018/the-hci-living-curriculum-as-a-community-of-practice>. URL is currently reserved (<http://hclivingcurriculum.org/>) and we are working on the development of the site.
- EduCHI Symposium. In 2018, we created EduCHI, a venue for HCI educators across disciplines and geographical borders to discuss, dissect, and debate HCI teaching and learning. The first EduCHI event was a workshop at the CHI 2018 conference in Montréal (<https://chi2018.hclivingcurriculum.org/>). Our workshop was a great success. As a result, we organized an EduCHI symposium at the CHI 2019 conference in Glasgow (<https://educhi2019.hclivingcurriculum.org/>). Results and actions from both EduCHI 2018 and 2019 can be found at the URLs mentioned above.
- HCI Education Taskforce. The SIGCHI Executive Committee recently created a taskforce to define its priorities relating to HCI Education over the next three years. The taskforce is the first mandate of the newly created SIGCHI Education Committee. Members are being recruited to join the task force. We are targeting members from different countries and backgrounds. Taskforce meetings will take place in the fall of 2019.

## SIGCSE

ACM Education Board/Education Advisory Committee representative: Mary Anne Egan.

The scope of SIGCSE is to provide a global forum for educators to discuss research and practice related to the learning, and teaching of computing, the development, implementation, and evaluation of computing programs, curricula, and courses at all education levels, as well as broad participation, educational technology, instructional spaces, and other elements of teaching and pedagogy related to computing.

Summary of activities:

- During 2019 SIGCSE held the following conferences:

Conference	Location	Attendees	Paper Acceptance
Technical Symposium	Minneapolis, USA	1809	32%
CompEd	Chengdu, China	154	33%
ITiCSE	Aberdeen, Scotland	280	27%
ICER	Toronto, Canada	150	20%

- This was the first meeting of the ACM Global Conference on Computing Education (CompEd). We also made changes to the leadership and governance processes for the three other conferences.
- SIGCSE received approval to offer three new awards. Two of these are one-time-only awards to celebrate the 50th and 25th meetings of the Symposium and ITiCSE. The Test of Time Award will first be awarded in 2020 and will continue annually.
- SIGCSE funded four special projects and 50 travel-grants for first-time attendees to the Technical Symposium. We also held a workshop for Department chairs, two doctoral consortia and 13 working groups at the Technical Symposium.

## SIGGRAPH

ACM Education Board/Education Advisory Committee representative: Susan Reiser.

The SIGGRAPH Education Committee, chaired by Ginger Alford, works to support educators in computer graphics and interactive techniques. The committee undertakes a broad range of projects and activities in support of the multidisciplinary—computer science, engineering, art—education community, such as developing curriculum guidelines, providing instructional resources, organizing SIGGRAPH conference-related activities and outreach. Our charter is to manage, promote and encourage education content in all conference activities; and highlight and strengthen the education community that attends SIGGRAPH.

Summary of activities:

- The 2018-2019 SIGGRAPH Education Committee had several subgroups involved in conference and year-round activities. For example, much of our recent work centered on preparing for the conference's Education Forum, which was held 07/29-30/2019, the first two days of SIGGRAPH 2019. Spearheaded by our conference liaison and committee

chair, SIGGRAPH 2019's programming included panels on industry perspectives and forums on teaching VR and animation. To engage SIGGRAPH educators and recruit participation in our committee, we scheduled an open forum to discuss the conference and the committee's interesting work. The open forum was followed by a *Meet and Greet* during which we could get to know attendees and encourage their participation. Throughout the conference, the committee staffed an Education Booth in a central location where conference participants could gather for informal conversation and to find out more about the Education Committee. Adjacent to the booth, notable student work was continuously looped on a large screen display.

- We continued the effort to link SIGCSE and SIGGRAPH with the SIGCSE Reprise during which outstanding and relevant-to-SIGGRAPH papers originally presented at SIGCSE 2019 were re-presented at SIGGRAPH. Similarly, a couple of panel sessions and papers from SIGGRAPH 2018 were presented at SIGCSE 2019 in Minneapolis, MN. Groovy Graphics (SIGGRAPH's adaptation of SIGCSE's Nifty Assignments) was again a popular session with SIGGRAPH educators. The first annual Distinguished SIGGRAPH Educator's award was presented on the big stage to Andy Van Dam.
- Almost 19,000 people attended SIGGRAPH 2019 in LA (roughly two thousand more than that of SIGGRAPH 2017 in LA and 2018 in LA and Vancouver). Educational opportunities at this year's conference included 26 courses and 150 technical papers.
- Students at SIGGRAPH 2019 had numerous ways to actively participate in the conference: volunteer as a student, submit a poster to the Student Research Competition, engage in the International Collegiate Virtual Reality Contest (IVRC), play a role in the Massive Collaborative Animation Project, and/or submit work to the Computer Animation Festival.
- During this past year the SIGGRAPH Education committee met at least monthly via videoconference. Immediately prior to the 2019 conference, the SIGGRAPH Education committee met for a full day to discuss activities and strategies. Specific topics included: our mission and goals, CGEMS, conference planning, SIGGRAPH Education website updates, outreach (global, K12, other organizations), and the ongoing curriculum study.

## **SIGHPC**

ACM Education Board/Education Advisory Committee representative: Steve Gordon.

Over the past year, there have been a number of efforts by SIGHPC and the SIGHPC Education chapter to support computational science education. These have included the continuation of an international fellowship program, awards, travel grants to students, an online seminar series on computational science education, expanded participation in education chapter activities in both the US and Europe, and participation in several major conferences.

Summary of activities:

- ACM SIGHPC/Intel Computational & Data Science Fellowships.

- SIGHPC and Intel awarded twelve fellowships in computational and data science aimed at increasing the diversity of students pursuing graduate degrees in these fields. The awards included a \$15,000 stipend. Seven fellows were selected in 2018. Information on the awardees and fellowship program can be found at <https://www.sighpc.org/for-your-career/computational-data-science-fellowships>.
- SIGHPC awards the biennial ACM SIGHPC Emerging Woman Leader in Technical Computing Award and the annual SIGHPC Outstanding Doctoral Dissertation Award, both of which include a \$2,000 cash prize, a plaque, and travel support to attend the SC conference where the awards are presented.
- SIGHPC runs the Computing4Change competition for undergraduate students from diverse backgrounds to explore problems in computing, data analysis, and visualization. SIGHPC funds the travel of the selected students' travel to the SC conference. Sixteen students participated in the Computing4Change competition at SC18.
- SIGHPC also supports student travel grants that provide partial travel support for up to six students to attend the SC conference in the US and up to four students to attend the PASC conference in Switzerland.
- Seminar Series. The SIGHPC Education Chapter continues to engaged its members through an online education and training webinar series featuring speakers from academic and non-academic institutions. A list of the webinars from this year can be found on the chapter website at <http://sighpceducation.acm.org/> along with pointers to the YouTube videos of the sessions.
- Expanded Participation in Education Activities. The SIGHPC Education Chapter merged its membership with an ad-hoc international committee on HPC education in March of 2018. The merger has expanded the training and education efforts internationally, adding several new members from Europe, Australia, New Zealand, China, and several other nations. The chapter has continued the work of four working committees focusing on various aspects of promoting education and training in computational science. Descriptions of the standing committees and their efforts can be found at <https://sighpceducation.acm.org/committees.html>. In addition, the chapter has just initiated a new committee on Systems Operations Education Committee in cooperation with the Systems Professionals virtual chapter. A description of its goals and can be found at <https://sighpceducation.acm.org/sysop.html>.
- Participation in Major Conferences. The SIGHPC Education chapter participated in several major conference over the past year. This includes a workshop at ISC18, a workshop at the PEARC conference, and a workshop and birds-of-a-feather session at the SC18 conference. The workshops focused on various aspects of HPC training and education.

## **SIGITE**

ACM Education Board/Education Advisory Committee representative: Mihaela Sabin.

SIGITE provides a forum for the interaction of practitioners, educators, and others in the field of Information Technology Education to exchange ideas and engage in activities that advance the knowledge of its members, the curriculum, teaching, and the development and transfer of innovative concepts and applications in technology and pedagogy.

Summary of activities:

- SIGITE continues to be financially stable and organizationally strong, with 372 members in fiscal year 2018-2019 (up from 322 in the previous year). Membership communications include listserv, web site, newsletter, and an annual conference. Total members since the organization's inception in 2003 is 1,647 members from 76 countries.
- The 19th ACM SIGITE Annual Conference on IT Education conference took place in Fort Lauderdale, October 3-5, 2018, and was hosted by the Broward College. This was the first year that the IT Education and Research in IT conferences were combined into one. Participation and submissions recorded higher numbers than previous year:
  - 145 attendees (vs. 126)
  - 101 submissions (vs. 94)
- The 20th ACM SIGITE Annual Conference on IT Education took place in Tacoma, WA, October 3-5, 2019, and was hosted by the University of Washington Tacoma. There were 56 paper submissions, 22 accepted (acceptance rate 39%). Other accepted submissions were lighting talks (13), posters (8), panels (5), and workshops (3).
- IT Transfer Curriculum is being led by the ACM Committee for Computing Education in Community Colleges. SIGITE participated with two members on a committee that was constituted in 2018 to prepare the two-year IT Transfer Curriculum in light of the new curriculum guidelines of the IT2017 Report (released December 2017). The committee met at the SIGITE 2018 conference, participated in online meetings, presented a poster on the proposed IT Transfer Curriculum at ITiCSE 2019, and held a panel to collect more feedback at the SIGITE 2019 in Tacoma. The committee plans to release a final report in December 2019.

## **Code.org**

ACM Education Board/Education Advisory Committee representative: Pat Yongpradit.

Summary of Activities:

- There are over 1.2M teachers and over 42M students in Code.org courses:
  - 46% of Code.org students are girls,
  - 48% are underrepresented minorities, and
  - 47% of US students are in high needs schools.

- 835,122,270 students have tried the Hour of Code. 50% of whom are female
- 3,296,655 total students (1,394,208 female) have demonstrated basic coding proficiency in Code.org's intro course, CS Fundamentals and 99% of surveyed teachers recommend the course.
- In 2018, 19,409 total students took the AP CS Principles exam through Code.org
  - 5,838 were female,
  - 4,009 were URM students. In 2019, Code.org's curriculum was used by 2,154 AP CS Principles teachers.
- Our middle school curriculum, CS Discoveries, sees even more interest than CS Principles; 44% of CS Discoveries students are URM.
- With the help of close to 70 regional partners, we've prepared more than 100,000 new teachers to teach CS across grades K-12.
- We are working in 180+ of the largest school districts to add CS to the curriculum. These districts teach almost 10% of all U.S. students and 15% of Hispanic and African American students.
- Policies have been changed in 49 U.S. states, and between Sept 2018 and Sept 2019, Code.org worked with over 33 states to help adopt 57 new policies to promote computer science.
- In Sept 2019, Code.org partnered with CSTA, CSforAll, and ECEP to run a 500-person conference which included tracks for state, national, and international organizations, state depts of education, higher ed, districts, curriculum/pd providers, and advocates.

## **Committee for Computing Education in Community Colleges (CCECC)**

ACM Education Board/Education Advisory Committee representative: Cara Tang.

A standing committee of the ACM Education Board since 1991, the global mission of the CCECC is *to serve and support community and technical college educators in all aspects of computing education*. The CCECC engages in curriculum and assessment development, community building, as well as advocacy in service to this sector of higher education. For more see [ccecc.acm.org/about](http://ccecc.acm.org/about), [ccecc.acm.org/about/charter](http://ccecc.acm.org/about/charter), and [ccecc.acm.org/about/members](http://ccecc.acm.org/about/members).

### Summary of activities:

- Cyber2yr (formerly CSEC2Y) – curricular guidelines for Associate Degree programs in Cybersecurity
  - Project started April 2018
  - StrawDog draft released Feb 2019
  - IronDog draft released July 2019
  - Currently collecting feedback from IronDog and working on final draft
- Cooperation with ABET in developing criteria for accrediting two-year programs in Cybersecurity, based on our Cyber2yr guidelines
- IT Transfer – curricular guidelines for IT transfer programs based on IT2017
  - Project started August 2018

- Currently finalizing a draft to be presented at SIGITE, October 2019
- Continuing presence at various conferences to support and build community, get feedback, and disseminate publications
  - Community College receptions, breakfast, booth, sponsorship, or other activity at SIGITE, SIGCSE, and 3CS
  - Presentations at conferences including SIGCSE, CCSC-SW, WASTC ICT Educators' Conference, Virginia Cybersecurity Education Conference, ITiCSE
- Continuing outreach via our web site, educator mailing list, social media, YouTube channel

## **CSTA**

ACM Education Board/Education Advisory Committee representatives: Jake Baskin CSTA CEO, Jane Prey, Bobby Schnabel.

### Summary of Activities:

- **CSTA Membership:** Over the last year CSTA's overall membership has grown to just over 36,000 total members, with just over 1,700 of those being CSTA+ members. In May we launched our new website and membership management system, which provides new insight into our membership. Since launching the new site on May 1 we have had 5,313 members create or update profiles on the site (3,493 logins), and an additional 1,820 that updated their profiles via a one-time link sent via email). That is about the same as the number of members ever logged into our old AMS in all of 2018 and 2019.
- **2019 Annual Conference:** The annual conference was a huge success, with 1,014 total attendees, representing a 36% growth in attendance from 2018 (with similarly sized growth in net revenue). Overall energy was outstanding, and post-conference surveys show that 98% of attendees felt the conference was a good use of their time, and 99% learned something they would take back to implement in their classroom this year. We are also proud of the investments we made to modernize the conference, including an electronic check in process, improved swag, an expanded exhibit hall and upgraded signage throughout the event. In 2020 we'll be celebrating the 20th anniversary of the conference in Arlington, VA, and have set a goal of growing to 1,200 attendees.
- **CSTA Chapters:** CSTA has added 13 new CSTA regional chapters, bringing our total to 75 chapter, covering 44 states, Puerto Rico, and two provinces. This summer's chapter leadership summit brought 72 confirmed participants representing 60 chapters. This represents a 33% year over year growth in the number of chapters participating in the summit, with scholarships for chapter leaders provided thanks to the generous support of Google. At the summit we released our new [chapter success rubric](#), and are working with each chapter leader to set growth goals aligned to the rubric.

## Other Items:

### Education Board Rotation and Education Advisory Committee Rotation:

The **ACM Education Board** and **Advisory Committee rosters at the end of FY 2019** were as follows (\* denotes members whose terms ended at the end of FY 20 and Advisors rotating off).

#### Education Board:

##### Members

<b>Co-Chair</b>	Jane C. Prey*
<b>Co-Chair</b>	Chris Stephenson
<b>Vice Chair</b>	Elizabeth K. Hawthorne
<b>Past Chair</b>	Mehran Sahami *
<b>Members</b>	Scott Buck *
	Tracy Camp
	Andrea Danyluk
	Andrew McGettrick
	Alison Derbenwick Miller
	Paul Tymann
	R. Venkatesh

**ACM Headquarters** Yan Timanovsky

**Ex-Officio** Jake Baskin (CSTA Executive Director)

#### Education Advisory Committee:

##### Members

Tom Cortina	Carnegie Mellon University
Michelle Craig	SIGCSE; University of Toronto
Janice E. Cuny	National Science Foundation (NSF)
Leigh Ann Delyser	CSforAll (CSNYC)
Mary Anne Egan	SIGCSE; Siena College
Susan Eisenbach	SIGPLAN; Imperial College London
Judith Gal Ezer	ACM Europe Council; The Open University of Israel
Armando Fox	Berkeley University
Mikey Goldweber	SIGCAS; Xavier University
Steve Gordon	SIGHPC
Shuchi Grover	STEM/CS Ed Researcher/Consultant/Trainer
Chris Hundhausen	TOCE Editor
Amy Ko	University of Washington
Paul Leidig	CSAB rep; Grand Valley State University; Data Science Co-Chair
Mirella M. Moro*	Brazil; Universidade Federal de Minas Gerais - UFMG
Brianna Morrison	University of Omaha
Andrew Peterson	University of Toronto
Beth Quinn	NCWIT
Donna Reese	CSAB rep; Mississippi State University (Emeritus)

Susan Reiser	SIGGRAPH; University of North Carolina at Asheville
Mihaela Sabin	SIGITE, University of New Hampshire
Bobby Schnabel	University of Colorado-Boulder; Ed Council Ethics Taskforce
Ben Shapiro*	ATLAS Institute; University of Colorado Boulder
Olivier St-Cyr	SIGCHI rep; University of Toronto
Cara Tang	CCECC Chair; Portland Community College
Peter Thiemann	SIGPLAN; University of Freiburg
Jodi L. Tims	ACM-W; Northeastern University
Ellen Walker	Hiram College
R. Venky	ACM India; Tata Consultancy
Mark Allen Weiss	SIGCSE rep; Florida International University
Pat Yongpradit	Code.org
Ming Zhang	ACM China; Peking University
Stu Zweben	NDC Study; The Ohio State University (Emeritus)
Yan Timanovsky	Headquarters Liaison

**Advisors**

Alison Clear	CC2020; (SIGCSE); Eastern Institute of Technology
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## Section Two – Future Plans

### Priorities for FY2019 - 2020

During the previous FY much progress was made on a number of fronts. New members of the Education Board and Education Advisory Committee are now in place. Our Advisory Committee meeting also generated a list of focus areas for FY2020.

### New Ideas for FY2019 – 2020 include:

NDC data analysis and Actionable Computing Enrollment and Retention (ACER) data analysis  
CS4All Higher Education Faculty working group  
Education in Ethics and Computing Taskforce  
2019 NDC study  
Transitioning *EngageCSEdu* repository to an ACM e-publication

### Plans for Future Work:

### Learning at Scale Conference:

ACM Education Board/Education Advisory Committee representatives: Mehran Sahami and Yan Timanovsky.

Future plans include:

- Planning for the Learning@Scale 2020 conference has progressed well. The Program Chairs are Susan Singer (Rollins College) and Rene Kizilcec (Cornell University). They are in the process of determining paper submission timelines, determining potential program committee members, and discussing possible invited speakers.
- The conference will likely be held on May 28-29 at Georgia Tech in Atlanta, Georgia (pending final confirmation from the university). In 2020, the conference will not be collocated with any other conferences.
- There have also been some preliminary discussions regarding possibly locating L@S 2021 at the Hasso Plattner Institute in Potsdam, Germany (collocated with the eMOOCs conference).

### NDC Survey:

ACM Education Board/Education Advisory Committee representatives: Jodi Tims (Co-Chair), Stuart Zweben (Co-Chair), Yan Timanovsky (Co-Chair).

Future plans include:

- Simplify fall 2019 NDC Study to focus on faculty questions. Include departments offering identifiable cybersecurity bachelor's programs.
- Obtain NSC data for 2018-19 to report bachelor's-level student data on enrollments and degrees for all six curriculum areas, including cybersecurity.
- Consider including retention data.

- Target article for September 2020 *Inroads*, consistent with past years' publication schedule.

### **Investigating CS Disparity of Entering College Students:**

ACM Education Board/Education Advisory Committee representatives: Tracy Camp and Beth Quinn.

Future plans include:

- Submit a one-page proposal to NSF before the end of 2019 to see if they would be interested in funding this research project.

### **Retention Taskforce:**

ACM Education Board/Education Advisory Committee representatives: Chris Stephenson (previous co-chair), Alison Derbenwick Miller (previous co-chair), and Stu Zweben (new chair).

Future plans include:

- Analyze 2017-18 data and prepare report(s) based on it. Publish results in suitable venue(s).
- Work with area leaders (e.g., Paul Leidig, Mihaela Sabin, Cara Tang) to obtain and analyze data from NSC about 2017-18 CS students who were not retained. Assess utility of this data for future investigations.

### **Computing for Social Good Taskforce:**

ACM Education Board/Education Advisory Committee representative: Mikey Goldweber (chair).

Future plans include:

- The taskforce will prepare and run a Special Session on Computing for Social Good at the SIGCSE Technical Symposium in March 2020.

### **Taskforce on Education in Ethics and Computing:**

ACM Education Board/Education Advisory Committee representative: Bobby Schnabel (chair)

Future plans include:

- Figure out the task force's role in constructing an ethics and computing taxonomy, and possibly help research and develop this taxonomy.
- Figure out the task force's role in creating an ethics and computing "repository" (courses, references, modules) and begin moving this forward. Initial plan is to create a crowd-sourced list of references on topics related to ethics and computing.
- Co-organize a proposal for an ethics and computing panel at the July 2020 CRA Snowbird meeting (with Responsible Computer Science and others).
- Coordinate with related ACM efforts, including COPE and Computing and Social Responsibility.
- Create and distribute initial communications to the ACM community.

## **Task Force to Develop Resources for Instructors to Improve Teaching and Peer Mentoring Practices:**

ACM Education Board/Education Advisory Committee representative: Briana Morrison (chair).

Future plans include:

- We are hopeful that during the 2020 calendar year the initial launch of *EngageCSEdu* as an ACM publication will occur. Initially, the *EngageCSEdu* platform will continue to reside on an NCWIT-owned server and maintained through joint efforts of NCWT and ACM Pubs. Eventually, complete ownership would be ACM Pub's responsibility which will involve migrating the existing platform to an ACM server, likely at a significant one-time cost. However, we are aware that ACM does have a Development Fund available to fund this effort if so desired.
- In the next year the task force intends to concentrate on looking at the second set of resources, those for peer mentoring.

## **CC2020:**

ACM Education Board/Education Advisory Committee representative: Alison Clear.

Future plans include:

- The report will be reviewed by as many communities and then completed. The completion date is October 2020.
- The visualization tools will be reviewed and the prototypes completed. The visualization tool prototype will be available for review at the SIGCSE Symposium in March 2020. The completion date is the end of 2020 depending on funding to build the main visualization tool.

## **Data Science:**

ACM Education Board/Education Advisory Committee representatives: Andrea Danyluk and Paul Leidig, Co-Chairs.

Future plans include:

- Release second draft in Fall 2019 with a call for comments
- Submit proposals/papers to conferences to continue conversations
- Work with various groups at ACM to determine mechanism for formally collaborating with professional societies outside of computing societies
- Release final document in late 2020

## **Committee for Computing Education in Community Colleges (CCECC):**

ACM Education Board/Education Advisory Committee representative: Cara Tang.

Future plans include:

- Cyber2yr – curricular guidelines for Associate Degree programs in Cybersecurity
  - Expect a final draft to the ACM Ed Board by the end of 2019, with publication in 2020
  - Disseminate final guidelines in FY20-21 (SIGCSE, ITiCSE, 3CS, mailing lists, etc.)
- Continue cooperation with ABET
- IT Transfer - curricular guidelines for IT transfer programs based on IT2017
  - Present draft guidelines at SIGITE, October 2019
  - Expect a final draft in FY20
  - Disseminate final guidelines in FY20-21 (SIGITE, ITiCSE, 3CS, mailing lists, etc.)
- Continue support of other ACM groups and projects with community college perspective, as appropriate (ACM curricular projects such as Data Science – Christian Servin currently serving, ACM-W celebrations – Cindy Tucker currently helping, etc.)
- Continue presence at conferences and outreach via various channels
- Continue maintaining web site as a resource for educators, and educator mailing list

## **CSTA:**

ACM Education Board/Education Advisory Committee representatives: Jake Baskin CSTA CEO, Jane Prey, and Bobby Schnabel.

Future plans include:

- Moving forward CSTA will continue to focus our energy on supporting our chapter network, growing our new membership tier, and enhancing the annual conference.
- On top of this, we're excited to launch a national CS Honor Society for high school students, release new standards for CS Educators in partnership with ISTE, and launch our inaugural cohort of CSTA Equity fellows.

## **Code.org:**

ACM Education Board/Education Advisory Committee representative: Pat Yongpradit

Future plans include:

- Curriculum & Learning Platform:
  - Finish support for CSTA standards, empower students to create sprite lab projects
  - Pilot integration of CS into subject matter for elementary school.
  - Support updated AP framework.
  - Enable better assessment support and reporting.
  - Make a plan to teach AI+ML
- Professional Learning Programs & Sustainability:
  - Decrease spending on workshops, while continuing to reach more teachers

- Expand virtual PD pilot
- International:
  - Increase translations of curriculum and tools and enable students to use tutorials offline and with intermittent network connectivity
- Advocacy:
  - Increase state policy adoption particular to CS standards, state plans, funding, and requiring all HS to offer CS
  - Increase data collection on which schools offer CS

### **Educational Efforts in China:**

ACM Education Board/Education Advisory Committee representative: Ming Zhang.

Future plans include:

- The ACM China Turing Award Celebration Conference 2020 (TURC 2020) will be held on May 23-24, 2020, in Hefei, China.
- ACM China SIGCSE Chapter will host the SIGCSE China Symposium at this conference.
- A council meeting of the ACM China SIGCSE Chapter also will take place during the conference.

### **Educational Efforts in India:**

ACM Education Board/Education Advisory Committee representative: R. Venkatesh.

Future plans include:

- Continue the national education initiative, *CSPathshala*.
- Continue offering summer school courses.
- Organize COMPUTE 2019 International symposium

### **Educational Efforts in Europe: Informatics for All:**

ACM Education Board/Education Advisory Committee representatives: Andrew McGettrick and Judith Gal-Ezer.

The next face-to-face planning meeting will cover the following topics:

- Reflecting on the 24th September meeting in Brussels
- Preparing a statement to be used in seeking to extend the Coalition beyond the current membership, so broadening the scope of Informatics for All (this has still to be formally approved)
- Considering the adoption of a logo
- Seeking to make contact with OECD/PISA
- The creation of additional smaller more local workshops to gather further support

## **SIGCAS:**

ACM Education Board/Education Advisory Committee representative: Mikey Goldweber.

Future plans include:

- SIGCAS believes that between its Computing for Social Good-Ed focus (which includes HFOSS) and its Ethics focus, we have a lot to offer to other SIGS and to the general education landscape. Our problem is getting the messaging out. There is interest and a willingness to run workshops at other conferences (regional educational, and conferences from other SIGs), but lack funding for such.
- SIGCAS has been running into the "repository" problem. There have been some discussions with *EngageCSEdu*. *EngageCSEdu* currently focuses solely on introductory CS education and they do not yet possess the capacity to go beyond. SIGCAS will be working on solving the "repository" problem.

## **SIGCHI:**

ACM Education Board/Education Advisory Committee representative: Olivier St-Cyr.

Future plans include:

- HCI Living Curriculum. We plan to present a budget to the SIGCHI Executive Committee to finish the development of the site (<http://hclivingcurriculum.org/>) and get HCI educators to start contributing materials. We plan to have the site up and running by mid-2020.
- EduCHI Symposium. We are currently planning the EduCHI 2020 Symposium, to be held (if accepted) at the CHI 2020 conference in Honolulu, HI, on April 25-26, 2020. We also plan to eventually move EduCHI to a stand-alone conference.
- HCI Education Taskforce. The taskforce will present a report to the SIGCHI Executive Committee outlining HCI Education priorities, projects, and budget. Projects and proposed budgets will be reviewed and sub-committees to implement the selected projects will be formed. Deliver a report to the SIGCHI Executive Committee by December 2019. Sub-committees and selected projects implementations are targeted for early 2020 and onward.

## **SIGCSE:**

ACM Education Board/Education Advisory Committee representative: Mary Anne Egan.

Future plans include:

- Several SIGCSE-sponsored conferences have experienced rapid growth in the past few years. This growth continues even with the creation of a new conference in 2019. The SIGCSE Board is working with conference volunteers to manage the growth of the conferences in a positive way that retains the character of the conferences.
- The Top Five ITiCSE Papers award was announced at the 2019 (24<sup>th</sup> annual) ITiCSE conference and will be presented in conjunction with the 25<sup>th</sup> annual ITiCSE conference in 2020.

## **SIGGRAPH:**

ACM Education Board/Education Advisory Committee representative: Susan Reiser.

Future plans include:

- The SIGGRAPH Education Committee plans to focus on outreach, curriculum study, conference preparation, and Computer Graphics Educational Material Sources (CGEMS) next year.
- We will continue our ongoing curriculum studies but narrow our focus to three items. Before SIGGRAPH 2020, the VR team will produce a report, the multidisciplinary (relevant for animation, art, and computer science) core SIGGRAPH knowledgebase will be published for comments, and the traditional computer graphics (re Foley and Van Dam or Angel and Shriner) knowledgebase will be updated and published for comment.

## **SIGHPC:**

ACM Education Board/Education Advisory Committee representative: Steve Gordon.

Future plans include:

- In the coming year, we expect to continue all of the activities from last year. There will be a new round of fellowship applications following approximately the same schedule as last year. We are currently seeking additional speakers for the seminar program. The award and travel programs will also continue.
- The SIGHPC Education chapter will be continuing efforts to evaluate and publicize both training and education resources that can be used by both academic institutions and professionals to expand their computational science expertise.
- A workshop has already been approved for the SC19 conference. Plans are also underway for a workshop at ISC20 and other conferences.

## **SIGITE:**

ACM Education Board/Education Advisory Committee representative: Mihaela Sabin.

Future plans include:

- Future SIGITE conferences have been scheduled for:
  - 2020 in Omaha, hosted by the University of Nebraska Omaha.
  - 2021 in Salt Lake City, hosted by Brigham Young University.
- SIGITE has been participating with six members on the IT Program Subcommittee of the ABET CAC/CSAB, charged with updating the IT Program accreditation criteria in light of the IT2017 Report, *Curriculum Guidelines for Baccalaureate Degree Programs in Information Technology*, released in December 2017. This is a multi-year process with the end-goal of having the updates approved by ABET/CAC/CSAB in 2020 and the new IT Program Criteria in place for site visits in 2021.
- Strategic Directions
  - Continue successful practices at SIGITE conferences, such as IT Chairs meeting and Standing Conference Planning Committee

- Add a special conference track for master's thesis and doctoral research
- Increase student travel scholarships
- Attract and recruit community college faculty to the SIGITE membership and conferences
- The two-year IT Transfer Curriculum is scheduled for release December 2019.

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