**ACM Education Board and Council
Annual Report**

**October 3, 2017**

**FY2017 Membership:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Ed Board** | **Affiliation/Sphere** | **Term Ending** | **Rotating in or off** |
| **Co-Chair** | Mehran Sahami |  | Jun-18 |  |
| **Co-Chair** | Jane C. Prey  |  | Jun-18 |  |
| **Vice Chair** | Elizabeth K Hawthorne | CCECC | Jun-18 |  |
| **Past Chair**  | Andrew McGettrick  | ACM Europe | Jun-18 |  |
| **Members** | Valerie Barr | ACM-W (and "smaller" schools) | Jun-18 | Rotating in from Ed Council |
|  | Scott Buck | Intel | Jun-18 | Rotating in from Ed Council |
|  | Tracy Camp |  | Jun-19 | Rotating in from Ed Council |
|  | Alison Derbenwick Miller | Oracle | Jun-18 | Rotating in from Ed Council |
|   | Chris Stephenson | Google | Jun-18 |  |
|  | Paul Tymann | AP CS Principles/SIGCSE | Jun-19 | Rotating in from Ed Council |
|  |  |  |  |  |
| **ACM Headquarters**  | Yan Timanovsky |  | NA |  |
|   | Bobby Schnabel | ACM CEO | NA |  |
| **Ex-Officio** | Deborah Seehorn (Interim CSTA Executive Director) | CSTA | NA |  |
|  |  |  |  |  |
| **Education Council** | **Affiliation/Sphere** | **Term Ending** |   |
| **Members** | Ginger Alford | SIGGRAPH rep | SIG appointed |  |
|  | Tracy Camp | Colorado School of Mines | Jun-18 |  |
|  | Michael Caspersen | ACM Europe | Jun-19 |  |
|  | Michelle Craig | SIGCSE | SIG appointed |  |
|   | Janice E. Cuny | NSF | Representing NSF |  |
|  | Andrea Danyluk | Liberal Arts/Small Schools | Jun-19 |  |
|  | Steve Gordon | SIGHPC | SIG appointed |  |
|  | Shuchi Grover | SRI | Jun-20 |  |
|   | Chris Hundhausen | TOCE Editor | Representing TOCE |  |
|  | Andrew J. Ko | University of Washington | Jun-20 |  |
|  | Paul Leidig | CSAB rep | CSAB rep |  |
|  | Jim Leone | CSAB rep | CSAB rep |  |
|   | Mirella M. Moro  | Brazil | 30-Jun-18 |  |
|  | Brianna Morrison | University of Omaha | Jun-20 |  |
|   | Peter Norvig | Google | Jun-18 |  |
|  | Barbara Boucher Owens | SIGCAS | SIG appointed |  |
|  | Andrew Peterson | University of Toronto | Jun-20 |  |
|  | Mihaela Sabin | SIGITE | SIG appointed |  |
|  | Deborah Seehorn | CSTA Volunteer Representative  | CSTA appointed |  |
|  | Ben Shapiro | ATLAS Institute | Jun-18 |  |
|  | Jodi L. Tims | NDC Study | Representing NDC |  |
|  | Gerrit Van der Veer | SIGCHI rep | SIG appointed |  |
|  | R. Venky | ACM India | Representing ACM India |  |
|  | Pat Yongpradit | Code.org | Representing Code.org |  |
|  | Ming Zhang | ACM China | Representing ACM China |  |
|  | Stu Zweben | NDC Study | Representing NDC |  |
|  | Yan Timanovsky | Headquarters Liaison  | ACM Staff |  |
|  |  |  |  |  |
| **Advisors** | Owen Astrachan | AP CS Principles |  |  |
|  | Daniel D. Garcia | AP CS Principles |  | Rotated off Ed Board |
|  | Alison Clear | CC2020; (SIGCSE) |  | Rotated off Ed Council |
|  | Eric S. Roberts | Booming Enrollments/Building Capacity Taskforce |  | Rotated off Ed Council |
|  | Heikki Topi  | AIS liaison; IS curricula; Data Science curricula |  | Rotated off Ed Board |

**Executive Summary**

This report summarizes the activities of the **ACM Education Board and the Education Council** in FY2017 and outlines priorities for the coming year. Major accomplishments for this past year include the following:

**Curricular Volumes:**

Computer Engineering 2016 (CE2016)

Information Technology 2017 (IT2017)

Enterprise Information Technology Body of Knowledge (EITBOK)

Master’s of Science in Information Systems 2016 (MSIS2016)

Computer Science Curricular Guidance for Associate-Degree Transfer Programs with Infused Cybersecurity (CSTransfer2017)

**New Curricular Efforts**

Cybersecurity curriculum effort (JTF on CSEC2017)

CC2020 (update of Computing Curricula Overview)

CCECC

 **International Efforts:**

Educational efforts in China

Educational efforts in Europe

Educational efforts in India

**Taskforces and Other Projects:**

Diversity taskforce

Retention taskforce

Capacity building taskforce

Learning at Scale

CS K-12 framework project

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

Code.org

CSAB

SIGCAS

SIGCHI

SIGCSE

SIGHPC

SIGGRAPH

SIGPLAN

**Other Items:**

Education Board Rotation

Education Council Rotation

**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 2017 Activities:

**Capacity Task Force:** For most of the past year, the work of the Capacity Task Force has focused on the National Academies Committee on the Growth of Computer Science Undergraduate Enrollments, on which both Eric Roberts and Tracy Camp serve.  That effort is still underway, and it is not yet clear whether the final report will include actionable recommendations that can help address this crisis.

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

Published Computer Science Curricular Guidance for Associate-Degree Transfer Programs with Infused Cybersecurity (CSTransfer2017) in June 2017

Available at http://ccecc.acm.org/CSTransfer2017

Completed the revision of the 2009 Associate-degree Curricular Guidance in Computer Science based on the ACM CS2013 guidelines, survey input, two rounds of feedback on public drafts, and has cybersecurity infused.

**CS K-12 Framework:** The K-12 CS Framework this past year had its official release in October 2016.

**Diversity Taskforce:** Established coordination with the CSTA on the development of diversity questions to be included in their International Member survey.

**Education Board and Council Rotation:** The Board rotation was completed for the first time without issue; the Council rotation for the second time. Yan Timanovsky (ACM staff) will maintain list of potential members and remind Board (co-)chairs in January of rotation process.

**INDIA:** The committee continued its focus on three areas - Faculty Development Programs (FDP), Bringing ACM 2013 curriculum to UG institutes in India and Bringing computing to school. We have also started summer schools on specific areas aimed at encouraging undergraduate students to take up research in those areas.

**Learning at Scale:** The Fourth Annual ACM Conference on Learning @ Scale (L@S) was held at MIT on April 20- 21, 2017. The conference is underwritten by the Education Board as the conference was originally conceptualized by the Education Board. Unlike previous years, this year the conference was not co-located with any other conferences. Fortunately, attendance was robust with a total of 187 attendees (including 57 students) registered for L@S 2017. The total revenue, including registrations and sponsorships, was sufficient to make the conference revenue positive. The 2018 conference will be located in London, UK, co-located with the International Conference of the Learning Sciences (ICLS) and the International Conferences on Artificial Intelligence in Education (AIED).

**NDC survey:** The results of the 2015-16 study, conducted in spring 2016, were published in the

September 2016 issue of *ACM Inroads*.

**Curricular Volumes:**

Computer Engineering 2016 (CE2016): Completed – ready for dissemination

Information Technology 2017 (IT2017): Completed – ready for dissemination

Enterprise Information Technology Body of Knowledge (EITBOK): Completed – ready for

dissemination

Masters of Science in Information Systems 2016 (MSIS2016): Completed – ready for

Dissemination

CSTransfer2017): Completed – ready for dissemination

**New Curricular Efforts**

**CC2020**: Memorandum of Understanding was signed with IEEE-CS to enable this to become a

 joint project.  We also have contributing SIGs, SIGCHI and contributing Societies, AIS

 and AITP. The Steering Committee has also been established.

**Cybersecurity curriculum**: Second draft published June, 2017 – out for public comments

**Data Science curriculum effort**: The Data Science Curriculum Effort will consist of 2 paths: 1) the

 Education Board and Council will stay involved as an active contributing member of

 broader interdisciplinary efforts to articulate the data science space and 2) given that

 there is a need for specific guidance to computing–focused data science programs, an

 effort will be launched for a more narrowly scoped and shorter-term development of

curriculum and competency guidance for CS- and IS-based data science degree programs.

These two efforts should be separate but coordinated effectively.

**Section One**

**Summary of FY 2017 Activities**

**Education Board strategic priorities**

The following were identified as strategic objectives for the Education Board established in 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 Council considerations
* To organize and manage meetings of the Education Council, to keep the Council members up-to-date with significant developments and generally to manage the work of the Council
* 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 Board January, 2014 in San Francisco, the following priority areas had been identified, namely supporting

* International Outreach
* Diversity
* Curricular guidelines
* Computing Terminology
* K-12 Computing

These priorities were continued for the FY2015. The priorities for FY2016 include all of the above with the addition of data science and cybersecurity to the curricular priority areas and the exploration of updating CC2005 into CC2020.

**Education Council FY2017 Activities**

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

**Projects & Taskforces**

**Capacity building taskforce**

Membership: Eric Roberts (chair), Owen Astrachan, Valerie Barr, Tracy Camp, Boots Cassel, Lissa Clayborn, Dan Garcia, Dan Grossman, Mark Guzdial, Rich LeBlanc, Andrew McGettrick, Alison Derbenwick Miller, Peter Norvig, Debra Richardson, Mehran Sahami, Ben Shapiro, Larry Snyder, Chris Stephenson, Stu Zweben

Goal of effort:

1. To analyze the situation facing academic computer science departments caught between rapidly rising student enrollments and an inability to hire the necessary faculty, both because of institutional constraints and a critical undersupply of faculty candidates.
2. To develop effective recommendations that academic institutions and other stakeholders can take to address the problem of insufficient capacity.
3. To ensure that all stakeholders understand that institutional responses to the capacity challenges can have significant consequences in terms of the diversity of the field and the supply of workers in a critical sector of the economy.

Current status:

For most of the past year, the work of the Capacity Task Force has focused on the National Academies Committee on the Growth of Computer Science Undergraduate Enrollments, on which both Eric Roberts and Tracy Camp serve.  That effort is still underway, and it is not yet clear whether the final report will include actionable recommendations that can help address this crisis.  Tracy Camp was part of a parallel effort at CRA that produced an report entitled *Generation CS: Computer Science Undergraduate Enrollments Surge Since 2006* that does an excellent job of collecting data on both the growth of enrollments and institutional response.  Fortunately, much of that material has found its way into the current draft of the National Academies report.  The work for the National Academies report has also included the creation of extensive analyses of the capacity challenges that will be of significant value in developing ACM’s own set of materials.

 Lessons Learned:

1. There is very little understanding of the capacity challenges facing computer science outside of the field itself.  The idea that institutions might be unable to hire faculty because of a shortage of candidates is so foreign to academics from other fields that it is often summarily dismissed in spite of compelling evidence.
2. Effective strategies will be easier to develop within the computer science field than in the context of more broadly based scientific organizations.
3. No matter how the National Academies report comes out, it is clear that ACM will have an opportunity to take the lead in developing resources to address the capacity challenges.

**CS K-12 framework project**

Ed Council representatives: Pat Yongpradit (Code.org) and Mehran Sahami (ACM)

Organization activity: The K-12 Computer Science Framework represents a vision in which all students engage in the concepts and practices of computer science. Beginning in the earliest grades and continuing through 12th grade, the framework provides guidance regarding concepts and practices to help students develop a foundation of computer science knowledge and learn new approaches to problem solving. The framework seeks to promote computer science as a tool for students to learn about and express themselves in a variety of disciplines, especially since students will actively participate in a world that is increasingly influenced by technology. The steering committee for the K-12 Computer Science Framework is composed of representatives from ACM (Mehran Sahami), Code.org (Cameron Wilson), CSTA (Mark Nelson), the Cyber Innovation Center (G.B. Cazes), and the National Math and Science Initiative (Deepa Muralidhar).

The most significant news for the K-12 CS Framework this past year was its official release (after over a year of work) in October 2016. Since that time, the framework has been widely publicized. More than a dozen states have been involved with helping to develop or support the framework, and it is being used as the basis for developing standards in several states. The framework was also well-aligned with the recently revised CSTA K-12 CS Standards so that the two may consistently support each other. Some highlights on news related to the framework in the past few months include:

* Framework presentation to California superintendents at their annual meeting
* A Framework presentation to California charter schools
* 10 states have CS standards now (Wisconsin being the 10th - and they used the Framework as an input), 7 states currently creating standards (all using the Framework)
* CSTA 2017 standards will be aligned to the Framework
* Framework being used in teacher preparation in some schools of education
* Framework being used to inform state strategic plans and visions for computing education
* Framework mentioned as part of legislative bills (ex: In one state they call for recommendations aligned to the Framework)
* Curriculum providers purporting alignment to the Framework
* A Girls Who Code club coordinator created a classroom monitoring tool based on the practices of the Framework (ex: making sure club leaders are creating an environment in which kids can communicate and collaborate per the Framework)

**Diversity taskforce**

Active Members: Lisa Kaczmarczyk (Lead), Mark Nelson, Chris Stephenson, Deborah Seehorn, Andrea Danyluk, Debra Richardson, Barbara Owens

Goal of Effort: To undertake effort(s) in support of diversity in computing education where the membership can most effectively leverage its expertise and resources to have concrete impact. To continue and build upon successful efforts in international diversity which were started in the prior year.

Current Status: The CSTA survey had initially been slated for dissemination in Fall 2016 but was subsequently postponed. During the Spring of 2017, questions were finalized and included in the CSTA International Survey, which is slated to be disseminated soon (but as of this writing has not yet been). The results of the data gathered in this survey will be used by the committee to determine its next efforts in support of international diversity.

Details**:** In the prior year, the task force noted that much of the current conversations on diversity have been U.S.-centric and that strong anecdotal evidence exists that diversity issues in other countries with which ACM is involved or desires to be involved may be very different. For example, social and economic divide may be a significant driver of diversity and equity imbalance (the digital divide) even more so abroad than here in the U.S. We had decided to work with the CSTA to develop diversity questions to include on their planned survey of International members. This survey, initially slated for Fall 2016, was postponed, providing the task force additional time to develop questions that would integrate in well with the rest of the survey.

August – February:

In the Fall of 2016, Winter 2016-2017, the group met via conference call 4 times and held discussions over email.

We were restricted to just a few questions (4 – 5) and chose to focus on obtaining basic information in these areas:

* What are the computing diversity concerns in member countries
* What is being done about computing diversity in member countries
* What is working in member countries wrt computing diversity efforts
* What are the challenges being encountered wrt computing diversity efforts in member countries

March – June:

At the March 2017 Ed Council meeting held at SIGCSE Lisa presented an interim progress report to the full Council.

The team developed draft questions to be submitted to the CSTA International Committee for approval.

Lisa is the current United States representative on the CSTA International Committee and served as liaison between the Diversity Taskforce and the CSTA. As part of this effort, Lisa worked directly with the other members of the CSTA International Committee on inclusion and placement of the questions, and wording adjustments to ensure smooth integration. This effort took place over a several month period.

The following diversity questions were finalized for inclusion in the survey:

* From what you know, at what age or school level do students begin learning computer science?
* As far as you know, is this the case throughout your country?
* From what you know, do all students have the option to study computer science?
* [if no] To the best of your knowledge is this because [ list of options follows]
* From what you know, is studying computer science mandatory for students?

The following related questions are included in the survey but not explicitly listed as diversity questions [they are listed as “Access” or “Student Engagement” questions]:

* Are you aware of any groups that have less access to computer science education?
* How would you describe/identify those groups?
* Are you aware of any groups that, despite having less access to CS education are less engaged in it?
* How would you describe/identify those groups?

Lessons Learned: International computing education is not well studied and little is known (thus the impetus for this effort). International computing diversity is challenging to study on a global scale due to wide ranging differences in cultural and communication norms, educational systems, accepted vocabulary, individual and group priorities, and many other issues.

**Learning at Scale**

Ed Council representative: Mehran Sahami

Organization activity: The Fourth Annual ACM Conference on Learning @ Scale (L@S) was held at MIT on April 20- 21, 2017. The Learning @ Scale conference is underwritten by the Education Board (rather than a SIG) as the conference was originally conceptualized by the Education Board. Unlike previous years, this year the conference was not co-located with any other conferences. As a result, we got a better sense of how this conference would do as a standalone. Fortunately, attendance was robust with a total of 187 attendees (including 57 students) registered for L@S 2017. This number is one of the highest attendance rates for the conference, showing that the community remains strong after the first few conferences. Registration costs were increased somewhat to help offset a trend in declining sponsorship for the conference. Total registration revenue came in at $71,260 (nearly double the previous year). Sponsorship for the conference totaled $16,500 (roughly half of the total from the previous year, which continued a trend of lower sponsorship since the first conference). The total revenue, including registrations and sponsorships, was sufficient to make the conference revenue positive. Expenses for the conference were $81,853.25, resulting in a surplus of $5,906.75 for the 2017 event. Given surpluses from the prior three conferences, Learning @ Scale is projected to have a total surplus of roughly $94,000 after the fourth conference in the series. So, while sponsorship revenue has decreased, the conference still seems quite viable financially.

**NDC survey**

Representatives to Ed Council: Yan Timanovsky, Jodi Tims, Stu Zweben

Goal of Effort: Provide data to Computing Community on Degree Production, Enrollments, and Faculty from Bachelor’s and Master’s programs in Non-doctoral-granting Departments in computing. Include demographic information by gender and ethnicity.

The annual study for 2016-17 was conducted in fall and winter of the 2016-17 academic year. This is the first time the survey was conducted during the fall semester. Response rates increased over those of the previous year, and were comparable to those of two years ago.

* Results of the study have been tabulated and a report for the September 2017 issue of *ACM Inroads* has been accepted for publication.

The results of the data collected from NDC academic units during the spring 2016 CRA enrollment survey were compiled and used in the CRA report “Generation CS: CS Undergraduate Enrollments Surge.” Since 2006 which can be found at www.cra.org/data/generation-cs. The data from NDC units was collected in conjunction with the 2015-16 annual NDC Study. The first of a series of articles about the Enrollment Survey’s results was published in the June 2017 issue of *ACM Inroads*. The first article focused on the overall size of the enrollment growth for both majors and nonmajors. A second article,

focused on the impact of the enrollment surge on diversity, has been accepted for publication in the September 2017 issue.

Lessons Learned:

NDC units often do not have support to help them in completing surveys of this kind. Thus, our response rates are adversely affected by this. We have compensated somewhat by reducing the complexity of the survey, but it still is a struggle to get good response rates.

The simultaneous demands of the NDC survey and CRA Enrollment Survey conducted in spring 2016 may have negatively affected the response rates to both surveys by NDC units.

**Retention taskforce**

Committee Members: Christine Alvarado, Lecia Barker, Valerie Barr, Tracy Camp, Erin Mindell Cannon, Carol Frieze, Colleen Lewis, Lee Limbird, Alison Derbenwick Miller (co-chair), Debra Richardson, Mehran Sahami, Chris Stephenson (co-chair), Elsa Villa, Henry Walker, Stuart Zweben,

Goal of Effort: The focus of this committee is 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.

Current Status: The committee’s work this year has focused on exploring key issues relating to the retention of women and URMs in CS1 and CS2. Issues we have considered include:

* Current sources of data and their limitations.
* The barriers to the collection/provision of more comprehensive data.
* Early and late major declaration.
* Interventions that are already showing promise.

The committee decided to partner with NCWIT to utilize anonymized data based on a set of parameters defined by the committee from NCWIT’s existing retention data collected through its Extension Services program. To support this work, we developed a Memorandum of Understanding (MOU) between ACM and NCWIT which both parties have signed. Work to collect and analyze the data is underway.

We have also worked out an agreement with the editors of *Inroads* magazine to produce three op/ed articles that will outline the issues and share promising interventions from a series of perspectives. This work is being undertaken by a subcommittee of Colleen Lewis, Debra Richardson, Elsa Villa, and Henry Walker. Four op-ed articles will be published by committee members in the December 2017, March 2018, and June 2018 issues. The first op/ed piece is due in September. We expect a final article detailing the work of the committee, including the data analysis, will be published in *Inroads* or a similar publication and a session will be proposed for SIGCSE 2018.

Lessons Learned to Date:

Retention is a highly complex issue and data collection is extraordinarily challenging for a number of reasons, including (1) a number of institutions do not collect any or all of this data, (2) a lack of consistent data collection and reporting formats for those who do, (3) privacy concerns that limit the ability to share non-aggregated data, (4) the inability to efficiently collect data regarding CS1/CS2 student intentions and/or reasons for taking the course, e.g., filling a requirement vs. potential interest in further study, (5) a lack of data regarding transfer students, from both other schools and other departments, and (6) the fact that “retention” itself is difficult to define, e.g., when is a student who doesn’t take a second year course a “retention problem,” and (7) institutions have different timelines for when students declare a major and tracking student intensions before declaration can be problematic.

Given the committee’s timeline, scope, and size, we decided it was not feasible to launch a new major data collection effort. Instead, we will work with data that are currently available (data from NCWIT and our committee member institutions), being careful to identify the limitations of this data set. We will analyze this data, and in our final report, share any observations that can be made. We also will offer observations and recommendations for further data collection and analysis efforts.

One early conclusion the committee has arrived at is that we believe a concerted data collection project by a dedicated, well-funded group is needed to adequately begin a robust, data-based conversation about CS retention.

**International Education Efforts**

**Educational efforts in China**

Representative: Ming Zhang

Inauguration Ceremony and Academic Symposium of China ACM SIGCSE Chapter at Linyi University, November 12, 2016

On November 12, 2016, the inauguration ceremony and academic symposium of the China ACM SIGCSE Chapter were held at Linyi University. Professor Ming Zhang from Peking University, the first chair of the China ACM SIGCSE Chapter, launched the inauguration ceremony with Professor Bo Yang, the vice chair. At the inauguration ceremony, Professor Yunhao Liu, the chair of ACM China Council expressed his congratulations and awarded certificates to the head committee members of the China ACM SIGCSE Chapter, Chair Ming Zhang (Peking University), Vice Chair in duty Bo Yang (Linyi University), Vice Chair Xiaoqiu Shi (Wenzhou University), Secretary General Weidong Liu (Tsinghua University), Vice Secretary General Junlin Lu (Peking University), Vice Secretary General Hongbo Jiang (Huazhong University of Science and Technology), and Vice Secretary General Juan Chen (National University of Defense Technology).

Professor Bo Yang, President of Linyi University, presided over the inauguration ceremony as well as the academic symposium. Professor Ming Zhang, Chair of the China ACM SIGCSE Chapter introduced the blueprint of the China ACM SIGCSE Chapter: bridging the gap between the Chinese and global computing societies, developing the world's cutting-edge computer education scientific research in China with international impacts, create more opportunities for collaboration among vigorous computing educators.

The Chair of the Harbin ACM Chapter, Professor Jianzhong Li, the Chair of the Nanjing ACM Chapter, Professor Junzhou Luo and Vice Chair of the Jinan ACM Chapter, Professor Chenglei Yang, expressed their congratulations to the China ACM SIGCSE Chapter. Members of China's ACM SIGCSE Chapter from more than 70 universities were there which included Peking University, Tsinghua University, National University of Defense Technology, Zhejiang University, Shanghai Jiao Tong University, Shandong University, Huazhong University of Science and Technology, Harbin Institute of Technology, Central South University, Southeast University, Renmin University of China, as well as others.

Professor Ming Zhang from Peking University delivered a keynote on Scientific Research of Computing Education, while Professor Jun Zhang from South China University of Technology presented another keynote on Frontiers of Cloud Computing, Internet of Things, Big Data and Artificial Intelligence: Evolutionary Computation.

SIGCSE China Symposium at TURC 2017, May 12-14, 2017

ACM Turing Award 50 years China Conference (TURC 2017) was held on May 13, 2017 in Shanghai, China. The ACM China SIGCSE Chapter hosted the SIGCSE China Symposium in this conference. An extended council meeting of the ACM China SIGCSE Chapter, including 32 members, was held during the conference. This meeting was chaired by Professor Ming Zhang, the Chair of the ACM China SIGCSE Chapter. At the meeting, the council members reported progress in the last year and discussed the follow-up arrangements. To date, the number of ACM China SIGCSE Chapter members has reached 286.

There are three keynote speeches in the SIGCSE symposium. Professor Amber Settle, the ACM SIGCSE Chair, gave a speech entitled “Refocusing Academic Integrity to Enhance Learning.” Professor Mark Guzdial, ACM Fellow, and professor Dan Garcia, ACM Distinguished Educator, brought the talks titled “Improving Success in Computer Science Education Lessons from Learning Sciences” and “Bringing ‘Trustworthy Network Big Data’ Ideas to High School Students,” respectively. The symposium also organized two panels with the topics of “Computer education research” and “Women in the academic field.”

This symposium accepted 16 papers. All papers were collected by the ACM Digital Library. Among them, the papers from two teams from Peking University won the Best Paper Award and the Best Student Paper Award respectively. Well-known computing educators shared the experience for computing major education, including training programs, curriculum system, curriculum and supporting experimental system design, implementation and evaluation. Besides the 100 more audience at the conference, the live Wechat broadcast was streamed to 286 SIGCSE China members from all over the country. So all the members can access the content of the symposium in real time and participate in the discussion on Wechat platform. This symposium promoted the full exchange of domestic and foreign computing education successfully.

**Educational efforts in Europe: Study on Informatics Education in Europe**

Representative: Andrew McGettrick

Computing education activities involving ACM Europe have been carried out in conjunction

with Informatics Europe, a group of (some) Heads of Computing Departments in Europe. A

joint committee was set up for this purpose; it was entitled the Committee on European

Computing Education or CECE for short. For completeness, the recent membership of

CECE has been:

ACM Europe

Michael Caspersen, Aarhus University, Denmark (Co-Chair)

Judith Gal-Ezer, Open University of Israel, Israel

Michael Kölling, Kings College, London, UK

Andrew McGettrick, University of Strathclyde, UK

Informatics Europe

Jan Vahrenhold, University of Münster, Germany (Co-Chair)

Cristina Pereira, ITH Zurich, Switzerland

Gérard Berry, INRIA, France

Enrico Nardelli, University of Rome Tor Vergata, Italy

with Mirko Westermeier, University of Münster, Germany (research assistant)

During the last year there was one major priority: to complete a two-year study involving a

deep assessment of the state of informatics education within each European country. Note

the parallel with the ACM / CSTA study “Running On Empty: The Failure to Teach K-12

Computer Science in the Digital Age.” See http://runningonempty.acm.org/.

Originally this was conceived as a two-year project, funded jointly by ACM Europe and

Informatics Europe. The work was carried out at the University of Munster by Mirko

Weistermeier under the guidance of Jan Vahrenhold. The report together with an interactive

map displaying information about the state of education in digital literacy and informatics

across European countries has now been completed. The major recommendations of the

report are:

Recommendations: Informatics

• All students must have access to ongoing education in Informatics in the school system. Informatics teaching should preferably start in primary school, and at the latest at the beginning of secondary school.

• Informatics courses must be recognized by each country’s educational system as being on a par with courses in other STEM disciplines. In particular, they must be given the same credit, e.g., for STEM requirements.

• The teaching of Informatics must be undertaken only by teachers who have obtained a formal education and qualification in Informatics and appropriate methodological training.

Recommendations: Digital Literacy

• Digital Literacy needs be taught from the early stages of education. However, it cannot be viewed as a substitute for the teaching of Informatics, the science enabling information technology, and must not be confused with it.

• Teaching of Digital Literacy should follow an agreed-upon, general curriculum that is periodically updated to reflect new developments in information technology. It should emphasize not only skills but also the principles and practices of using them effectively, safely, and ethically.

• Teaching of Digital Literacy should be undertaken with care and sensitivity by teachers who have undertaken appropriate training. For this, teacher training modules on Digital Literacy need to be developed and implemented.

Recommendations: Teacher Training

• The vicious circle of a shortage of Informatics courses and Informatics teachers needs to be broken by training and hiring Informatics teachers even in times of budget shortages.

• The hiring of Informatics teachers must follow the same standards as for all other disciplines. In particular, neither formal requirements nor methodological training must be sacrificed.

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Informatics for All

This effort should be seen as a follow up to the work of the CECE group. Its focus is the

implementation of the CECE recommendations but the opportunity has been taken to try to

gain the kind of enthusiasm associated with the Obama initiative CS4All. However, in

Europe there is no equivalent to the National Science Foundation or the launching of the CS

Principles course. So a different strategy had to be adopted.

ACM Europe and Informatics Europe approached CEPIS, the Council for European

Professional Informatics Societies, asking them to become involved. As it happened, that

body had become increasingly concerned about the state of education in Computational

Thinking (their term!). Basically a Coalition of the three bodies has now been formed from

the three groups

* [www.informatics-europe.org](http://www.informatics-europe.org)
* <http://europe.acm.org>
* <https://www.cepis.org>

Noting that Michael Caspersen has recently assumed responsibility for educational efforts

within Informatics Europe, the membership of the Informatics for All Coalition is:

Chair: Wendy Hall

For Informatics Europe: Michael Caspersen and Enrico Nardelli

For CEPIS: Bob McLaughlin and Fiona Fanning

For ACM Europe: Judith Gal-Ezer and Andrew McGettrick

Advisor: Bobby Schnabel from ACM

Support: Pat Ryan from ACM.

* The terms of reference discussed at initial meetings are:
* The Coalition should strive to significantly advance education in informatics and digital skills across the countries of Europe. For the sake of clarity (in the eyes of politicians, policy makers, etc.) it should be mindful to draw a distinction between education in the vital and foundational discipline of informatics and the acquisition of digital skills.
* It should seek to build on earlier work of the member organizations (and others as appropriate) and to develop an initiative that has the enthusiastic active support of all member organizations. Importantly it should further strive to have the initiative supported and promoted by the EU.
* The Coalition may wish to add a small number of other organizations to its membership; they should be willing to assist with the work of the Coalition. A small number of additional personnel may also be added as needed, e.g. to serve as intermediaries between the Coalition and the EU.
* The member organizations should be kept informed regularly of progress. The Coalition should feel free to change its name to better suit its purpose.
* The Coalition shall cease to exist after the initial two years should substantial progress not be made.

To date the work of the Coalition has involved trying to harmonize the views and

understandings of the different organizations. The intention is for ACM Europe and

Informatics Europe to partner members of CEPIS in rolling out the recommendations to the

different countries / regions and providing support as required.

Other Activity

The public policy arm of ACM Europe published in October 2016 a report:

Fabrizio Gagliardi, Chris Hankin, Judith Gal-Ezer, Andrew McGettrick, Maarja Meitern,

“Advancing Cybersecurity Research and Education in Europe: Major Drivers of Growth

in the Digital Landscape,” produced by the Europe Policy Committee of the ACM, October

2016.

**Educational efforts in India**

Representative: Venkatesh R

The committee continued its focus on three areas - Faculty Development Program (FDP), Bringing ACM 2013 curriculum to UG institutes in India, and bringing computing to school.

Faculty Development Program

We organized two FDPs on Algorithms in Delhi and Pune. A total of 50 faculty members from nearby institutes attended these programs. Each of these programs covered those topics of algorithms that the faculty found difficult to teach. The programs also included sessions by Industry practitioners illustrating the application of the concepts in a practical setting. All the slides of the FDPs have been made available, additionally the videos of the Delhi FDP have been uploaded on Youtube. Online feedback was taken from participants of the Chennai (conducted a year ago) and Delhi FDPs several months after the FDP. Most of the respondents felt the FDP helped improve the quality of their teaching and also student performance and feedback. The next step is to find a more scalable model to conduct these FDPs. NPTEL is a national organization that conducts online courses on various computing topics. We are exploring working with them to conduct online FDPs in order to scale up better.

CSPathshala

The CSPathshala pilot to introduce computing education in 15 schools in Pune has been very successful. Since then we have developed a curriculum and content for standards 1-8. The curriculum has been developed with the help of CS faculty from leading universities and research institutes in India. The content has been created by more than 100 volunteers from various IT companies and is available for download from <http://www.cspathshala.org>. Several workshops for teachers were conducted in different cities including Chennai, Bangaluru, Kochi, Ahmedabad, Mumbai, Pune, Goa, and Delhi. This year the pilot has been extended to around 100 schools across the country. In Goa and Gujarat we are working with government bodies.

Undergraduate Curriculum

As part of evangelizing of the ACM curriculum we held three workshops in Gandhinagar, Kolkatta, and Indore. All these workshops were well attended and fairly interactive. We plan to hold at least three more workshops, one each in Chandigarh, Chennai, and Bhopal. We also have a representative on the ACM CC2020 steering committee.

National Programming Aptitude Test (NPAT) The concept of NPAT to test the programming aptitude of students has taken shape. NPTEL has agreed to own the test. It is also supported by NASSCOM, and the website is hosted by Google. A core committee has been formed and three faculty members have created a first version of the test and practice problems. The Ministry of Human Resources and Development has been notified and they are supportive of it. A demo site is ready and we will soon launch the test.

Summer Schools

This year we started summer schools targeted at undergraduate students from institutes across the country. The aim of these schools was to expose the students to the state-of-the-art in the area and also interesting problems that are not yet solved. This is with the hope that some of them will go on to do research in these areas. These schools are organized by a host institution and ACM identifies expert faculty to conduct the schools. Two schools were on information security, one on machine learning, and the fourth was on graph theory and graph algorithms. One of the schools on information security was for women participants only and it was very well attended.

**Curricular Volumes**

**Computer Engineering Curricular Guidelines 2016 (CE2016)**

CommitteeACM: John Impagliazzo (Hofstra U), Task Force Chair Susan Conry (Clarkson U), Victor Nelson (Auburn U), Joseph Hughes (Georgia Tech), Liu Weidong (Tsinghua U, China), Lu Junlin (Peking U, China), Andrew McGettrick (Strathclyde U, Scotland)

IEEE Computer Society: Eric Durant (MSOE), Herman Lam (U of Florida) Robert Reese (Mississippi State), Lorraine Herger (IBM Research)

Goal of Effort: The goal of the CE2016 project is to produce a modern undergraduate curriculum in computer engineering that reflects contemporary advances in the field. The report is responsive to the needs of its constituents through workshops and events as shown in Table 1 (at the end of this report). The report draws upon the 2004 published curricular report in computer engineering, also known as CE2004. It also draws upon recent efforts in computing curricula developed by the Association for Computing Machinery (ACM), the IEEE Computer Society, and the Association for Information Systems (AIS).

Status: The project concluded on time with a publication date of 2016 December 15. Both ACM and IEEEComputer Society endorsed the report, which already appears on the ACM website: <http://www.acm.org/binaries/content/assets/education/ce2016-final-report.pdf>. The project already published a Chinese version of CE2016 that appears on the ACM website: <http://www.acm.org/binaries/content/assets/education/ce2016-final-report-chinese.pdf> .

**Enterprise Information Technology Body of Knowledge (EITBOK)**

Membership:

|  |  |
| --- | --- |
| Core Writing TeamIEEE Computer SocietyChuck Walrad, Editor in ChiefJan Clayton, EditorSusan EarleyLeslie GuthDeborah HendersonJorge MurilloBrenda ByersACM RepresentativeJohn Impagliazzo | Other ContributorsDeclan BradyKevin Brennan“J” EkstromKate GuillemetteJeff HolmesRichard BakerEric HibbardLen FehskensMaureen McVeyChris PrinceBill UlrichKen NidifferMike Davis |

Goal of Effort: Enterprise information technology (EIT) is the application of computers and telecommunications equipment to store, retrieve, transmit, and manipulate data, in the context of a business or other enterprise. The goal of the EITBOK project is to promote a consistent view of enterprise IT work and its importance worldwide and across national boundaries. The project provides consistency with an internationally accepted skills framework (SFIA) as the basis for role definitions and as a basis for competency evaluations. It provides a single, readily accessible portal to the widely scattered parts of a relevant body of knowledge with information about existing international standards, as well as providing a common, unified foundation for discussing, analyzing, and maturing the EIT profession.

Status**:** The IEEE-CS released the initial version of the project in the first quarter of 2017. The EITBOK link is: <http://eitbokwiki.org/Main_Page>.  The project is now in its marketing stage. See <https://www.computer.org/web/pressroom/ieeecs-eitbok>.

Lessons Learned: The IEEE Computer Society recognizes that it has taken thousands of people-hours to complete a work of this magnitude and the volunteers are invaluable – especially the dedicated few. In the end, the hope is that much perseverance and patience will result in a positive result.

**Information Technology 2017 (IT2017)**

IT2017 Task Group Membership: Mihaela Sabin, Chair & ACM Representative, University of New Hampshire, USA SIGITE; John Impagliazzo, Executive Committee ACM Education Board Representative, Hofstra University, USA; Hala Alrumaih, Executive Committee ACM Representative, Al Imam Mohammad Ibn, Saud Islamic University, Saudi Arabia; Barry Lunt Executive Committee ACM Representative, Brigham Young University, USA, SIGITE; Ming Zhang, Executive Committee ACM Representative, Peking University, China; Brenda Byers, Industry Representative, IEEE CS Representative, Federation of Enterprise Architecture Organizations, Canada; Bill Newhouse, Industry Representative, ACM Representative, NIST, USA, ISACA; Bill Paterson, ACM Representative, Mt. Royal University, Canada, SIGITE, Svetlana Peltsverger ACM Representative Kennesaw State University, USA, SIGITE; Cara Tang, ACM Representative, Portland Community College, USA; Gerrit van der Veer, ACM Representative, Vrije Universiteit Amsterdam, the Netherlands, SIGCHI; Barbara Viola, Industry Representative, ACM Representative, VioTech Solutions, USA, AITP.

The 12-member IT2017 task group has diverse composition by gender (7 women, 5 men), type of work affiliation (3 from industry/government, 9 academics), geography (representation from 5 countries in 3 continents), and international professional society membership (ACM, IEEE-CS, Association of IT Professionals (AITP), Canadian Information Processing Society (CIPS), ISACA, and Federation of Enterprise Architecture Organization(FEAP)).

Goal of Effort: The vision of the IT2017 report is to be a sought-after and durable set of guidelines to help educational institutions around the world develop modern IT curricula for the next 10 years. The goal of the effort is to produce a globally accepted document of IT competencies appropriate for undergraduate degree programs that meets the growing demand of the changing technological world and is useful for both industry and academia.

Current Developments

* The task group worked diligently to prepare a second interim report, IT2017 v0.61. The report was open for public review and comment August 15 - October 15, 2016.
* The task group scheduled its last 2 ½ days face-to-face meeting in Boston on October 1-3, 2016, following the SIGITE/RIIT conference. Meeting accomplishments were:
	+ Drafting competencies for inclusion in the IT Curricular Framework chapter (applying the Understanding by Design approach)
	+ Replacement of the ”credit hour” measure with a relative measure of learning a particular IT content relative to the entire duration of the IT program of study (regardless of specific institutional conventions about measuring the duration of an undergraduate IT program)
	+ Presentation by Burning Glass of data in support of the report’s emphasis on industry perspectives
	+ Plans to review public comments and schedule the integration of updates into the report
	+ Addition of more examples of IT program curriculum implementations
	+ Revised definition of IT
* The IT2017 v0.61 generated 190 responses from academia and 24 from industry.
* Task group members integrated this feedback in their rewriting of the report chapters and development of three additional interim reports, v0.68, v0.71, and v0.75.
* The last interim report, v0.75, was open for public review at <http://it2017.acm.org> between May 4, 2017 and June 22, 2017.
	+ There were 136 respondents from academia and 7 from industry/government, representing 25 countries. More than half had relevant comments.
* The task group integrated the comments by July 17, 2017 and reviewed and approved the report final version on July 27, 2017.

Lessons Learned:

1. Organizing principle of the IT2017 report are competencies​, not body of knowledge (with areas, units, and topics)

* Competency-based approach - what students should be able to do with what they learn, as opposed to a body of knowledge-based approach - what the curriculum content consists of
* Learning experiences designed around real-life, work-related situations and aspects of work that IT professionals and researchers are involved with.

2. IT competencies model

* Connects knowledge, skills, and dispositions
* Offers a performance perspective on learning transfer
* Conceptualizes competencies as higher-level learning outcomes linked to performance tasks and descriptive of a professional context.

3. IT Curricular Framework is a three-dimensional structure of domains, subdomains, and competencies.

* IT domains structure core aspects of IT (big ideas):
	+ 10 Essential IT Domains refer to competencies that all IT students must achieve
	+ 9 Supplemental IT Domains encompass competencies in domains where students do more specialized work. Students are required to achieve some subset of the supplemental domains and their competencies.
* A competent graduate from a four-year IT degree program should experience the equivalent of at least 1.5 years of IT studies (duration of the program’s IT technical component).
	+ At least 40% of the IT technical component of the degree program should match IT essential domain competencies
	+ At least 20% of the IT technical component of the degree program should match IT supplemental domain competencies
	+ The remaining 40% represent other IT domain competencies that reflect the goals, resources, and context of individual IT programs.
* Three levels of learning engagement, L1, L2, and L3, are used as a comparative metric in relationship with mastery learning of each subdomain
	+ L2 subsumes L1, and L3 subsumes L2
	+ Model continual broadening and deepening of learning and learning progressions
* IT domain clusters combine scope statements, competencies, and subdomains.

4. New definition of IT:

* Information Technology is the study of systemic approaches to select, create, apply, integrate, and administer secure computing technologies to enable users to accomplish their personal, organizational, and societal goals.

5. New visual depicting IT discipline: tapestry metaphor

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6. Report appendix with examples of IT curricular examples:

* Traditional four-year: United States, Saudi Arabia, China, Latin America, South Africa
* IT in other contexts: Canadian example, Applied CS, Business Administration and Assurance, three-year example, 2+2 year example Figure 4.1 IT competencies model.



**Masters of Science in Information Systems 2016 (MSIS2016)**

The four task force members representing ACM were Heikki Topi (Bentley University, USA; ACM co-chair), Brian Donnellan (Maynooth University, Ireland), Jun Shen (University of Wollongong, Australia), and Mark Thouin (University of Texas at Dallas, USA).

The task force also had four members representing AIS: Helena Karsten (Åbo Akademi University, Finland; AIS co-chair), Sue Brown (University of Arizona, USA), João Alvaro Carvalho (Universidade do Minho, Portugal), and Bernard Tan (Singapore National University, Singapore).

In addition, members of the computing community provided general feedback and specific guidance to the project.

Goal of Effort: The goal of this multi-year effort was to design and develop an entirely new replacement of the previous graduate level curriculum guidance document MSIS 2006 Model Curriculum and Guidelines for Graduate Degree Programs in Information Systems. The effort was planned to differ from MSIS 2006 in the following ways:
1) The primary focus of MSIS 2016 is on articulating graduate competencies and not on specifying characteristics of the curriculum.
2) MSIS 2016 was developed and will be maintained by a task force with broad global representation and with a recognition of the significant differences between program characteristics depending on the context in which they are offered.
3) MSIS 2016 explicitly recognizes a broad range of domains of practice (such as business, health care, government, law, various fields of science, etc.) that information systems capabilities can support (instead of just focusing on business, as was the case in earlier versions of curriculum guidance for IS master’s programs).
4) MSIS 2016 explicitly recognizes that students entering a master’s program may have gained the prerequisite competencies in a variety of ways.

Current Status: The final version of the MSIS 2016 Competency Model was approved by the ACM Education Board in November 2016 and by the AIS Council in December 2016. After a lengthy journal production process, the document was published by ACM on the ACM education website (<http://www.acm.org/binaries/content/assets/education/msis2016.pdf>) and by AIS in the *Communications of the AIS* in May 2017.

Lessons Learned:

The key lessons learned from the process are as follows:

1. Establishing and executing a genuinely global curriculum guidance development process requires much more time and effort than a similar process in a single-country context, but the benefits of bringing in the richness of the global perspectives significantly outweigh the costs.

2. Educational systems and degree types vary so significantly across the world that it would be very difficult, if not impossible, to develop a globally applicable model focusing solely on the curriculum. Using graduate competencies as a common currency made it possible for the project to achieve its goals.

3. Overall, the approach that focused on graduate competencies provided a variety of benefits for this project (as appears to be the case also for the new undergraduate IT curriculum). It would be useful for ACM and its collaborators to consider more broadly the role the competency-based approach should play in the future curriculum guidance efforts.

4. Face-to-face meetings were an essential component of the task force’s portfolio without which it would have been very difficult to achieve the goals of the project. They formed a solid foundation on which effective ongoing work using web conferences, shared workspaces, collaborative editing and other distributed technologies was possible.

5. One of the most important challenges for the project was to find a balance between the graduates’ and their employers’ current needs and the not yet known competency needs of the future. Developing structural mechanisms for continuous maintenance and updating of the curriculum recommendation documents with an ongoing editorial structure and strong technology support is becoming increasingly urgent.

6. Getting high volumes of high-quality feedback from various stakeholder groups was more difficult than expected. Based on the experiences from this project, it seems that it would be useful to establish a structural mechanism for gaining feedback from key industry collaborators.

7. Collaboration between ACM and AIS continued successfully in this effort, and without this collaboration the project would not have been possible.

**Curricular Efforts (In Progress)**

**CC2020**

Goal: To produce an updated overall computing curricular document, in electronic form to reflect and enable global interpretation of all computing curricular recommendations.

Current Status: In April 2017 a Memorandum of Understanding (MOU) was signed with IEEE-CS to enable this to become a joint project and work collaboratively.  We also have contributing SIGs, SIGCHI and contributing Societies, AIS and AITP. The Steering Committee of 13 people consists of:

ACM

Alison Clear - Co-leader; New Zealand

John Impagliazzo, USA

Shingo Takada,   Japan

Ming Zhang, China

Abhijat Vichare,   India

IEEE-CS

Allen Parrish - Co-leader, USA

Steve Frezza,  USA

Arnold Pears, Sweden

Pearl Wang, USA

Ernesto Cuadros-Vargas, Peru

Other Societies

Heiki Topi – AIS, USA

Las Waguespack – AITP Ed-Sig, USA

Gerrit van der Veer – SIGCHI, Netherlands

There is also a Task Force of a further 20 people representing a further eight countries making a global coverage of 13 countries.

The Steering group met in March 2017 and planned the year’s work. The first task was to gather data to better understand the current status and use of the CC2005 Computing Curricula document. We developed a survey which was sent out globally and has now been closed and received over 1800 responses which will be analyzed in the coming weeks.  We also proposed a software tool to help universities map, benchmark, and develop computing degree programs in all areas of computing.  This will be developed when the results of the survey are analyzed.

The first full meeting of the Steering Committee takes place on 1st and 2nd August 2017 just prior to the ACM Education Council meeting.

There have been two international presentations to date, one at the Australasian Education Conference in January 2017 and a panel presentation at the SIGCSE Symposium in Seattle in March 2017.  The intent was to gather information on the use of the 2005 document and determine the value of an updated document.  Both presentations and feedback from the audience participation demonstrated a genuine desire for an updated document and a benchmarking tool.

**Cybersecurity Curriculum Effort (CSEC2017)**

Purpose: The purpose of the Joint Task Force on Cybersecurity Education (JTF) is to develop comprehensive curricular guidance in cybersecurity education that will support future program development and associated educational efforts. (<https://www.csec2017.org/about>)

Definition: The JTF defines cybersecurity as a “computing-based discipline involving technology, people, information, and processes to enable assured operations in the context of adversaries. It involves the creation, operation, analysis, and testing of secure computer systems. It is an interdisciplinary course of study, including aspects of law, policy, human factors, ethics, and risk management." (<https://www.csec2017.org/about>)

Members:

* Diana Burley, The George Washington University, co-chair (ACM)
* Matt Bishop, University of California Davis, co-chair (ACM)
* Scott Buck, Intel Labs (ACM)
* Joseph J. Ekstrom, Brigham Young University (IEEE)
* Lynn Futcher, Nelson Mandela Metropolitan University (ACM)
* David Gibson, United States Air Force Academy (CEP)
* Elizabeth K. Hawthorne, Union County College (ACM)
* Siddharth Kaza, Towson University (ACM)
* Yair Levy, Nova Southeastern University (AIS)
* Herbert Mattord, Kennesaw State University (AIS)
* Allen Parrish, United States Naval Academy (IEEE)

Milestones:

* First draft of curricular guidance version 0.50: January 2017 ([www.csec2017.org/jtf-artifacts](http://www.csec2017.org/jtf-artifacts))
	+ Over 2,300 downloads
* Second draft of curricular guidance version 0.75: June 2017 ([www.csec2017.org/jtf-artifacts](http://www.csec2017.org/jtf-artifacts))
	+ Over 500 downloads
* Other Artifacts ([www.csec2017.org/jtf-artifacts](http://www.csec2017.org/jtf-artifacts))
	+ Diana Burley's testimony before the US House Science, Space and Technology Subcommittee on Research & Technology, February 2017
	+ November 2016 Survey Results
	+ September 2016 ISEW Report
* Community Engagement: ([www.csec2017.org/community-engagement](http://www.csec2017.org/community-engagement))
	+ Community College Cybersecurity Summit (3CS) - June 28-30, 2017, National Harbor, MD
	+ Industry Advisory Board Webinar - June 28, 2016
	+ National Governors Association, Meet the Threat: States Confront the Cyber Challenge National Summit! - June 14, 2017, Leesburg, VA
	+ Colloquium for Information Systems Security Education (CISSE) - June 12-14, 2017, Las Vegas, NV
	+ IFIP WISE Meeting - May 29-31, 2017, Rome, Italy
	+ Atlanta SecureWorld - May 31-June 1, 2017, Atlanta, GA
	+ ACM SIGCSE - March 8-11, 2017, Seattle, WA. Note: March 8th - Affiliated event targeted to industry and global engagement; March 11th - Special session targeted to academic engagement
	+ 3rd Annual *Journal of Law and Cyber Warfare* - November 3, 2016, New York, NY
	+ National Initiative for Cybersecurity Education (NICE) Conference - November 1-2, 2016, Kansas City, MO
	+ CyCon US: International Conference on Cyber Conflict - October 21-23, 2016, Washington, DC
	+ Cyber Maryland Conference - October 20-21, 2016, Baltimore, MD
	+ CYBERSEC: European Cybersecurity Forum - September 26-27, 2016, Krakow, Poland
	+ Community College Cyber Summit (3CS) - July 22-24, 2016, Pittsburgh, PA
	+ Americas Conference on Information Systems (AMCIS) - August 11-14, 2016, San Diego, CA
	+ National Cyber Summit - June 8-9, 2016, Huntsville, AL
	+ Colloquium for Information Systems Security Education - June 13-15, 2016, Philadelphia, PA
	+ International Security Education Workshop - June 13-15, 2016, Philadelphia, PA (co-located with CISSE)
	+ Women in Cybersecurity (WiCyS) - March 31 - April 2, 2016, Dallas, TX
	+ ACM SIGCSE - March 2-5, 2016, Memphis, TN
	+ Cyber Education Project Industry Advisory Board - February 26, 2016, Webinar
	+ National Science Foundation Cyber Corps PI Meeting - January 14, 2016, Arlington, VA
	+ NICE Interagency Coordinating Council - January 14, 2016, Arlington, VA
	+ Pre-ICIS Workshop on Security & Privacy (WISP) - December 13, 2015, Ft. Worth, TX

**Data Science Curriculum Effort**

Lillian “Boots” Cassel (Villanova University) and Heikki Topi (Bentley University)

*Goal of Effort:* The initial primary goal of this effort was to determine the feasibility of an interdisciplinary initiative to develop curriculum guidance for data science either at the undergraduate or graduate level (or both) and to set a foundation for broad-based, multi-society collaboration to develop such guidance. An additional goal was to identify ongoing data science curriculum development initiatives globally and determine how ACM can best advance data science education in the context of the other efforts.

*Current Status:* Building on a successful workshop organized in 2015-16 (see <http://www.computingportal.org/sites/default/files/Data%20Science%20Education%20Workshop%20Report%201.0_0.pdf>), the effort focused in 2016-17 on collecting additional information regarding existing data science-related curriculum initiatives and bringing together U.S.-based professional and academic societies to determine feasibility for effective collaboration in this area.

In March 2017, the effort organized a meeting attended by the Association for Computers and the Humanities (ACH), Association for Computing Machinery (ACM), Association for Information systems (AIS), American Statistical Association, IEEE Computer Society (IEEE-CS), INFORMS, and iSchools to discuss opportunities for collaboration between these societies that all have an active interest in data science education. In addition, Business-Higher Education Forum (BHEF), the National Academies, and a European EDISON project joined the meeting to share information regarding their activities, and American Association for Advancement of Sciences (AAAS) was part of the preparation process. The key findings of the meeting were as follows:

1. Even the choice for the best label that should be used to describe data science is unclear given the breadth of the interests by the participating societies. The group ended up using the term Data Science and Analytics (DSA) to incorporate both data science and different variants of analytics.
2. The views regarding DSA held by the participating communities have both shared elements and substantive differences.
3. The participating communities are not sure whether DSA is an emerging new field or an amalgamation of existing areas.
4. The participating communities do not have a shared language to describe DSA, and the terminological challenges are not trivial.
5. There is value in exploring, identifying, and analyzing the commonalities and differences in ways that allow the participating communities to inform each other.
6. If the participating communities do not explore their commonalities, they will lose opportunities to identify synergies and learn from their differences.
7. The communities propose to pursue further work to better understand DSA as an area of study and education. The process required for the study should consist of the following activities:
* Formulating the goal
* Gathering data regarding educational programs and analyses
* Cleaning, organizing, and annotating the collected data
* Analyzing and visualizing the data
* Interpreting the results
* Reporting and disseminating the results

The conclusions of this work from the ACM perspective are discussed in the Lessons Learned section below.

It is also important to document the main ongoing curriculum and competency guidance projects related to data science and analytics, including the following:

* The European EDISON project (<http://edison-project.eu>)
* The Roundtable on Data Science Post-Secondary Education organized by the National Academies of Sciences, Engineering, and Medicine and sponsored by Moore Foundation, NIH, National Academies Kellogg Foundation Fund, ACM, and ASA (<http://sites.nationalacademies.org/DEPS/BMSA/DEPS_180066>)
* National Academies NSF-funded project “Envisioning the Data Science Discipline: The Undergraduate Perspective” (<https://nsf.gov/awardsearch/showAward?AWD_ID=1626983>)
* Work on Data Science and Analytics by Business-Higher Education Forum (such as recently released <http://www.bhef.com/publications/investing-americas-data-science-and-analytics-talent>)
* Curriculum development for business intelligence, big data and analytics by the information systems community (reported, for example, in  <http://aisel.aisnet.org/cais/vol36/iss1/23/>)

*Lessons Learned:* There are two parallel ways to approach data science education and development of guidance for data science programs:

1. Any integrative initiative that attempts to address the needs of the broad data science community should be preceded by a conceptual clarification and landscape mapping effort such as one proposed by the March 2017 described above—the individual society initiatives and perspectives do not even have shared terminology that would allow them to work together effectively.  Such initiative would be beneficial and important from the perspective of the long-term success of the field. Success in this type of initiative requires broad-based inter-organizational collaboration, and ACM should be an active (or even a leading) participant in such an initiative representing the computing perspective.
2. Computing does, however, also have justifiable short-term reasons to provide curriculum and competency guidance to those programs that are offering data science programs with a clear computational perspective. There are different versions of these programs, and it is likely that we can identify a CS-based and an IS-based variant, which, however, are likely to share a substantial common core. As a relatively short-term effort, ACM Ed Council/Ed Board would provide the computing community with substantial benefits by launching limited time and scope effort(s) to develop curriculum guidance for these programs with the full understanding that this work is a part of a much broader context.

Based on the current status and findings of the original broad-based initiative, we recommend that a) ACM should stay involved as an active contributing member of broader interdisciplinary efforts to articulate the data science space with some financial support and b) given that there is a need for specific guidance to computing–focused data science programs, ACM should launch—likely with its traditional curriculum partners AIS and IEEE-CS—more narrowly scoped and shorter-term effort(s) to develop curriculum and competency guidance for CS- and IS-based data science degree programs. These two efforts should be separate but coordinated effectively.

**SIGs and Other Organizations Reports**

**SIGCAS**

Ed Council Representative: Barbara Boucher Owens

Two brainstorming groups – one on Social Issues and Ethics which were close to the mission of SIGCAS and integral to the special pre-SIGCSE session was held in March 2017. The second related activity was the discussion on the diversity report and input from the council members at the SF meeting.

I continue to serve on the diversity subcommittee of the Ed Council and report on it to the SIGCAS leadership. I have taken ideas from our discussions back to SIGCAS through several tweets on the SIGCAS twitter feed. I plan to prepare a brief article for inclusion in a future SIGCAS Bulletin Newsletter.

The SIGCAS pre-conference session on driverless cars was a training session on ethics education showcasing a technique developed at James Madison University consisting of 8 key questions. Those considerations form the acronym “FOR CLEAR”: Fairness, Outcomes, Responsibilities, Character, Liberty, Empathy, Authority and Rights. The session included small groups which considered the issues around driverless cars in the context of the 8 questions and the mixing of the group members.

**SIGCHI**

Ed Council representative: Gerrit C. van der Veer

SIGCHI support for student participation:

* SSTG - The SIGCHI Student Travel Grant (SSTG) program is intended to enable students who lack other funding opportunities to attend SIGCHI-sponsored or co-sponsored conferences. This travel grant is intended to support students whose intention is to present at a SIGCHI-sponsored conference, not just attend. Students are expected to apply for a SSTG for a particular conference. The application process is designed so that applications are due at least 6 weeks before the conference's earliest submission date, and so that grants will normally be awarded at least one month before the conference's earliest submission date. Each award consists of an honorarium of up to $1,800 USD to partially cover conference registration and travel expenses including airfare (economy flights only), accommodation, subsistence, and other expenses necessary for attending the conference.
* SIGCHI sponsored 13 students from around the world to attend the ACM 50 Years of the A.M. Turing Award Celebration
* In recognition of Gary Marsden’s contributions and inspiration in HCI4D and support of HCI in the developing world, ACM SIGCHI established the Gary Marsden Student Development Fund in 2015. This fund is especially intended for sponsoring SIGCHI student members who are postgraduate students (Master or PhD degree) from and currently based in developing countries to attend SIGCHI-(co)sponsored conferences as well as other HCI relevant conferences. In the last year, 21 students were awarded by the fund.

SIGCHI supports Human Computer Interaction education for researchers and practitioners at all levels at CHI and our Specialized Conferences. SIGCHI’s flagship conference CHI has an established track record of offering a wide variety of courses. SIGCHI-sponsored Specialized Conferences are also strongly encouraged to offer specialism-relevant courses at CHI and in their own conferences. SIGCHI-sponsored conferences, both specialized and CHI, are encouraged to offer three kinds of courses:

* foundational concepts for newcomers and those wanting to revisit and refresh their knowledge of HCI as an area of research and practice
* specialized courses focused on depth in specific established and/or emerging areas and
* technical skills and methodology courses which offer hands-on practical skill development.

In December 2016 SIGCHI published a call for sponsorship of HCI Summer/Winter Schools. Following a review, the SIGCHI Executive Committee selected seven of the proposals submitted. The selected events will be in Australia, China, Ireland, Poland, Mexico, USA, and Switzerland in 2017.

* Computational Fabrication and Smart Matter: This summer school takes place 14-18 June 2017 in Cambridge, MA, USA.
* International summer school on computational interaction: This summer school takes place 12-17 June 2017 in Lucerne, Switzerland.
* International Summer School on e-Health and m-Health: This summer school is tentatively scheduled for the 26-30th June in Dublin, Ireland.
* Summer School on Methods in Human-Computer Interaction: This summer school takes place 7-14 July 2017 in Łódź, Poland.
* Summer School on Pervasive Interaction for binational challenges: This summer school takes place 28th Aug - 1st Sept 2017 in Ensenada, Mexico.
* Summer School on Playful Interactions with OzCHI: This summer school takes place 24-27 November 2017 in Melbourne, Australia.
* The future of crowdsourcing in developing countries -technical, design, social, and ethical implications: This summer school takes place 10-14 July 2017 in Suzhou, China.

**SIGCSE**

The SIGCSE community continues to be very active and a strong partner with the Education Council. This year’s highlights:

SIGCSE Conferences

* The SIGCSE Technical Symposium was held on March 8-11, 2017 in Seattle, WA, USA. There were 1,501 attendees, representing the largest attendance in the symposium’s history.
* The conference on Innovation and Technology in Computer Science Education (ITiCSE) was held on July 3-5, 2017 at Università di Bologna, Bologna, Italy.  ITiCSE will be kept in the vicinity of Europe for the next 4 years.
* The International Computing Education Research (ICER) Workshop, September 8-12, 2016 Melbourne, Australia. There were 84 people in attendance.

In-cooperation (with SIGCSE) status was approved for a number of conferences in FY17

* Koli Calling 2017
* Western Canadian Conference on Computing Education (WCCCE 2017)
* Working Shop in Primary and Secondary Computing Education (WiPSCE 2017)
* Several Consortium for Computing Sciences in Colleges (CCSC) regional conferences including CCSC-MW ‘17, CCSC-SE’17, CCSC-NW’17, CCSC-EA’17, CCSC-RM’17, CCSC-MS’17, CCSC-NE’17, CCSC-SW’17, CCSC-CP’17, and CCSC-SC’17
* First Annual Conference on Research on Equity and Sustained Participation in Engineering, Computing, and Technology (RESPECT 2018)
* Australasian Computing Education Conference (ACE 2017)

Programs

* Twenty-four applications were received in FY 2017 with six SIGCSE Special Projects funded for a total of $19,560.
* The Speaker’s Fund was used to support the dissemination of outstanding SIGCSE Symposium, ITiCSE, or ICER presentations to in-cooperation conferences.  Speakers were supported for two conferences in FY 2016 for a total of $2,000.00.
* The Travel Grant Program supports first-time attendance at the SIGCSE Symposium for faculty and K-12 teachers by providing $500 for travel.  Six awards were made to support attendance at the 2017 SIGCSE Technical Symposium.
* The annual Doctoral Consortium was held in conjunction with the 2016 International Computing Education Research (ICER) Workshop in Melbourne, Australia.  There were 19 participating doctoral students.
* Every other year the SIGCSE Board sponsors a Department Chairs Roundtable where challenges and opportunities for people serving as departmental chairs are discussed and addressed. On March 8, 2017 the Department Chairs Roundtable was held in Seattle, Washington. The event was organized by Mary Lou Maher and Frank Young, and thirteen people attended. SIGCSE provided funds for meals at the event, which was partially offset by a nominal charge for attendance
* The 2017 SIGCSE Symposium held twenty four three-hour workshops for professional development. In addition, the SIGCSE Symposium provided meeting space for eleven events, namely POGIL in CS, Managing the Early Academic Career for Women Faculty and Women Graduate Students, Strategies for Integrating Driverless Cars into the Computing Curricula, Aligning to the ACM Cybersecurity-infused Computer Science Transfer Curriculum, Making K-12 Computer Science Accessible, POSSE Roundup, Student Participation in Humanitarian Open Source Software, NSF UP CS Ed Research Event for Emerging CS Education Researchers at SIGCSE, ACM Joint Task Force for Cybersecurity Education, CSforAll Consortium Networking Reception at SIGCSE, Breakfast with BlueJ and Greenfoot, and CRA Teaching Track Faculty Lunch.

**SIGGRAPH**

Ed Council representative: Ginger Alford, Education Chair of SIGGRAPH

The 2016-2017 SIGGRAPH Education Committee has 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, scheduled to begin 7/30/2017 at SIGGRAPH 2017 in LA. Spearheaded by our conference liaison, SIGGRAPH 2017's programming includes panels on industry perspectives, Computer Graphics Educational Material Sources (CGEMS), and interdisciplinary curricula (CS + X). To engage SIGGRAPH educators and entice their participation in our committee, we have scheduled an open forum to discuss the conference and the committee's interesting work. The open forum will be followed by a Meet and Greet during which we can get to know attendees.

In an effort to link SIGCSE and SIGGRAPH, one of this year's conference sessions will be a SIGCSE Reprise during which four outstanding and relevant-to-SIGGRAPH papers originally presented at SIGCSE 2017 will be presented at SIGGRAPH 2017.

Immediately prior to the conference, our committee will meet to discuss activities and strategies. Specific topics include: our mission and goals, CGEMS, planning for the 2018 conference, SIGGRAPH Education website updates, outreach (global, K12, other organizations), and continuing the curriculum study.

**SIGHPC**

Ed Council representative: Steven I. Gordon

SIGHPC represents the community of high performance computing academics and professionals from around the world. SIGHPC awards the SIGHPC/Intel Computational & Data Science Fellowships annually.  Computational and Data Science Fellowships is a program to increase the diversity of students pursuing graduate degrees in data science and computational science. Sixteen fellowships were awarded in 2016 and the next cadre of fellowships will be announced in July 2017.

The SIGHPC Education chapter has as its purpose the promotion of interest in and knowledge of applications of High Performance Computing (HPC).  The chapter sponsors webinars focusing on both undergraduate and graduate education programs that include applications of high performance computing to solve problems in science, engineering, and data science as well as educational efforts that promote technology education at all education levels.  The chapter also maintains a list of online training and education materials that are used to educate the current generation of students in the applications of high performance computing.

**SIGITE**

Education Council Representative: ​Mihaela Sabin

Organization

* Financially stable, about $115K in account
* Membership stable, FY16: 336 members

Membership communication

* Newsletter
* Active listserve: job postings, conference announcements, committee solicitations

Participation in the ACM Turing Award Celebration

* Sponsored one student to attend
* Sponsored SIG Chair to attend

2016 SIGITE/RIIT Conferences, September 28 - October 1, 2016

* Location: Boston, hosted by University of Massachusetts-Boston
* Participation
	+ 151 attendees
	+ 114 submissions, 87 paper submissions
* Collocated with the Research in IT (RIIT) conference
	+ The 17th Annual SIGITE conference: 67 submissions, 26 accepted (39%)
	+ The 5th Annual Research in IT conference: 20 paper submissions, 9 accepted (45%)
* Near record attendance, near record submissions

2017 SIGITE/RITT Conferences, The 18th SIGITE and 6th RIIT, October 4 - 7, 2017

* Location: Rochester, NY, hosted by Rochester Institute of Technology
* Participation:
	+ 90 submissions, 67 paper submissions
* Collocated with the Research in IT conference
	+ SIGITE: 56 paper submissions
	+ RIIT: 11 paper submissions

**Code.org**

Ed Council representative: Pat Yongpradit

Code.org is committed to broadening participation in K–12 computer science. Code.org was one of the five organizations, including the ACM, that served on the steering committee for the K–12 Computer Science Framework.

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

Ed Council Representative: Cara Tang

CCECC GLOBAL MISSION: <http://ccecc.acm.org/about>

The ACM CCECC serves and supports community and technical college educators in all aspects of computing education.

CCECC PURPOSE: <http://ccecc.acm.org/about>

The ACM Committee for Computing Education in Community Colleges (CCECC) is a standing

committee of the ACM Education Board concerned with computing education at associate-

degree granting colleges in the United States and similar post-secondary institutions throughout the world. The Committee engages in curriculum and assessment development, community building, as well as advises on public policy and advocacy in service to this sector of higher education.

Leadership:

• Cara Tang, PhD, CCECC Chair; Department Chair and Faculty, Portland Community

College, OR

• Cindy Tucker, CCECC Vice-Chair; Professor, Bluegrass Community and Technical College, KY

• Elizabeth K. Hawthorne, PhD, CCECC Past Chair; Senior Professor, Union County College, NJ

• Christian Servin, PhD, CCECC member; Professor, El Paso Community College, TX

• New member as of July 1, 2017: Markus Geissler, PhD, CCECC member; Professor, Cosumnes

River College, CA

Accomplishments

* After two and a half years, published Computer Science Curricular Guidance for Associate-Degree Transfer Programs with Infused Cybersecurity (CSTransfer2017) in June 2017
	+ Available at <http://ccecc.acm.org/files/publications/CSTransfer2017.pdf>
* Completed the revision of the 2009 Associate-Degree Curricular Guidance in

Computer Science

* Based on the ACM CS2013 guidelines, survey input, two rounds of feedback on

public drafts, and has cybersecurity infused.

* A task group of 20 community college educators participated in and led the effort.
* A panel session at Community College Cybersecurity Summit (3CS), June 2017, introduced the final guidance to the community for the first time.
* At ITiCSE 2016,
* Moderated a panel on Global Perspectives on the Role of Junior Colleges in Computing Education
* Presented a poster, gathering international input on the then-current draft of CSTransfer2017
* Formed an international advisory group, with initial members Margaret Hamilton, RMIT

University, Melbourne, Australia; and Reyyan Ayfer, Bilkent University, Turkey

* At SIGITE 2016,
	+ Hosted a community college reception for the second year in a row.
* At SIGCSE 2017,
	+ Hosted an evening dessert reception for community college educators and friends for the second year in a row, sponsored by Intel, with a drawing for tech prizes;
	+ Engaged with the community gaining input on, and spreading awareness of the CSTransfer2017 guidelines though a pre-symposium event, BoF, and poster;
* Staffed a booth in the exhibit hall to facilitate interactions with the community.
* Vitalized the CCECC’s social media presence on Twitter and Facebook to expand outreach with a fresh look, current content, and ongoing activity.
* Utilized Facebook LIVE to broadcast CCECC presentations at SIGCSE and 3CS, making them available to a global audience.
* Recruited one new Committee member (joined July 1, 2017)
	+ Markus Geissler, Cosumnes River College, CA
* Maintained the website ([ccecc.acm.org](http://ccecc.acm.org/)) with updated committee publications and conference events.
* Maintained CCECC educator database with over 5,000 email contacts of two-year college computing educators
* Continued serving on the [ACM Education Council and Education Board](http://www.acm.org/education/education-council-and-education-board)
* Continued serving on the [ACM Education Policy Committee](http://www.acm.org/education/education-policy-committee) –
* Continued serving on the [ACM-W Council](file:///%5C%5Chqfs01%5Cacmshr%5CYan%5CEducation%20Board%5CAdmin%20Stuff%5CAnnual%20Report%2C%20Budget%2C%20etc%5CAnnual%20Reports%5Cwomen.acm.org)
	+ Shared booth space at SIGCSE 2017
* Continued to support increasing community college participation in ACM-W work.
* Continued to use our educator database to generate lists of community college faculty located near ACM Women in Computing (WIC) celebrations, and provide customized lists to each U.S. WIC coordinator to facilitate personalized invitations to the events. In 2016-2017, lists were generated for 11 WICs across the U.S.
* Continued collaborating with [CSTA](http://www.csteachers.org/)
	+ Shared booth space at SIGCSE 2017
* Continued serving on the [Joint Task Force for Information Technology](http://it2017.acm.org) to develop undergraduate curricular guidelines
* Continued serving on the [ACM Joint Task Force for Cybersecurity Education](http://www.csec2017.org/) to develop undergraduate curricular guidelines
* Engaged in a variety of advocacy and outreach efforts on behalf of computing education in the community college sector, including the following conferences: Community College Cybersecurity summit (3CS) 2016 (July), ITiCSE 2016 (July), SIGITE 2016 (September), SIGCSE 2017 (March), and Community College Cybersecurity Summit (3CS) 2017 (June).
* Ongoing communications with colleagues via the featured, quarterly Community College Corner column in *ACM Inroads* – columns available in the ACM Digital Library as well as from <http://ccecc.acm.org/literature/publications>.
* Ongoing dissemination and outreach activities, including periodic mailings and email messages to contacts in the CCECC educator database, website enhancements, articles, conference sessions, and exchanges and collaborations with colleagues.
* Ongoing support for the ACM Education Council and Education Board goals and objectives.

**CSAB**

Representative:  Harold Grossman

Ed Board approves the representative Directors to CSAB.

**CSTA**

Ed Council representative:   Deborah Seehorn

The [2017 CSTA K-12 Computer Science Standards](http://www.csteachers.org/page/standards) were released during the 2017 CSTA Conference.  The newly revised standards used the [K-12 Computer Science Framework](https://k12cs.org/) as one primary input during the development process. The 2017 CSTA Standards Revision Task Force crafted standards by combining concept statements and practices from the Framework. The CSTA Standards Revision Task Force also used descriptive material from the Framework when writing examples and clarifying statements to accompany the standards.

The 2017 CSTA Annual Conference in Baltimore was the largest CSTA conference to date with 665 attendees, 40 sessions, 20 workshops, and 42 exhibitors.  Scholarships were offered to 170 educators from supporters including Google, Oracle, Rolls-Royce, and Facebook.

Deborah Seehorn and Mark Nelson both participated on the ACM Ed Council Diversity Task Force and connected Chair Lisa Kaczmarczyk with the CSTA International Committee.

**Other Items:**

**Education Board Rotation and Education Council Rotation:** One of the goals Mehran and I defined when we first became Education Board and Council co-chairs was a publicly posted Education Board and Council Rotation policy/procedure.

The rotation policy for Education Council Rotation has now been executed successfully twice. Yan is keeping a list of potential Council members for the next rotations.

The rotation policy for the Education Board was executed for the first time this year without issue. One question that needs discussion by the Board is what pre-requisites are required to become a Board member (e.g., service on the Education Council??).

The rotation of the Board and Council will be done annually for the foreseeable future. Yan will bring this to the attention of the Board (co-) chairs each January.

**Section Two**

**Priorities for FY2018**

During the previous FY much progress was made on a number of fronts. New members of the Education Board and Education Council is now in place. Our Council meeting August 3-4, 2017 in Boston also generated a list of new ideas for FY2018.

**Ideas for FY2018 include:**

1. More international focus
* Curricular and workshop opportunities
* Develop best practices for committees interested in having global impact
1. Taskforce looking at graduate-diploma/post-baccalaureate/Masters-for-people-without-CS-background programs
* What does computing education look like in the future? Vision
* Socio-technical side of computing
* New IS curricular volume
* Ramifications of CS For All in higher education

**Plans for Current Work**

**Capacity building taskforce**: The Capacity Task Force needs to develop a set of resource materials that are easy for institutions to use. To this end, the materials must be relatively short and must focus on solution strategies that can be adopted with limited resources.

ACM should develop better mechanisms for supporting institutions facing challenges that often seem insurmountable within the institution itself. For example, ACM could establish advisory panels that could visit institutions and make recommendations specific to that environment.

The Capacity Task Force should work with the ACM Policy Committee to encourage national, state, local, and corporate initiatives to develop new teaching capacity in computer science.

**CC2020**: When the results of the survey have been analyzed and assuming they are as positive as the feedback received to date, the requirements analysis of the software benchmarking tool will be developed.  Further data will be gathered from areas not covered in the first survey.  The updated document will also be started.  A plan of data gathering and dissemination will also be developed.

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

* Disseminate the newly published CSTransfer2017 guidelines to the community
* Collect program examples for CSTransfer2017, to appear on the CCECC web site at [ccecc.acm.org/guidance/computer-science-2017/correlations](file:///%5C%5Chqfs01%5Cacmshr%5CYan%5CEducation%20Board%5CAdmin%20Stuff%5CAnnual%20Report%2C%20Budget%2C%20etc%5CAnnual%20Reports%5Cccecc.acm.org%5Cguidance%5Ccomputer-science-2017%5Ccorrelations)
* Begin new associate-degree curricular guidance in Cybersecurity based on work of the ACM JTF for Cybersecurity Education
* Update and grow the database of community college computing educators
* Continue to seek international perspectives to the Committee’s work
* Continue recruiting and mentoring new CCECC members
* Continue engaging with the community through social media channels, and utilizing Facebook LIVE
* Ongoing maintenance of committee website <http://ccecc.acm.org/literature/publications>
* Continue serving on the ACM Education Board (Elizabeth Hawthorne)
* Continue serving on the ACM Education Council (Cara Tang)
* Continue serving on the ACM Education Policy Committee (Elizabeth Hawthorne)
* Continue serving on the ACM-W Council (Cindy Tucker) and collaborating with ACM-W
* Continue serving on the JTF for Information Technology (Cara Tang)
* Continue serving on JTF for Cybersecurity Education (Elizabeth Hawthorne)
* Continue collaborating with CSTA
* Continue communications with colleagues via the quarterly Community College Corner column in *ACM Inroads*
* Continue a variety of advocacy and outreach efforts on behalf of computing education in the community college sector, such as various conferences, articles, meetings, and workshops.
* Ongoing community-building, outreach, and dissemination activities, including conference sessions, periodic email messages to contacts in the CCECC educator database, social media engagement, website enhancements, articles, and exchanges and collaborations with colleagues.
* Ongoing support for the ACM Education Council and Education Board goals and objectives.

**Code.org**: Code.org will continue to offer curriculum, tools, and professional development at no cost, promote computer science education awareness, develop a network of regional partners, and engage in federal and state level policy and implementation. States, organizations, and institutions of higher education have used the Framework to guide the development of standards, curriculum, and teacher preparation programs. Implementation resources will be developed as a follow-on to the release of the K–12 CS Framework in October 2016. Code.org and the other steering committee organizations will continue to promote and provide technical assistance to states interested in using the Framework.

**Computer Engineering 2016 (CE2016):** Although the project concluded, it is now in its dissemination phase. There will be a paper presentation at the 2017 Frontiers in Education (FIE) conference in October. There may be other useful events for dissemination purposes as the occasions arise.

CE2016 Presentation Events

 

**CS K-12 framework project**: The plans for the coming year include promoting the framework to more stakeholders (e.g., state/districts education boards and policy makers, educational organizations, schools, etc.). The steering committee will have quarterly calls to discuss developments with the framework and organize activities as needed.

**CSAB**

* Approval of Accreditation Criteria:
* General Criterions 3 and 5 (2nd  reading)
* Program Criteria( 2nd reading): Computer Science, Information Systems, and Information Technology
* New Program Criteria: Cybersecurity (1st  reading)
* Nominate 52 commissioners
* Training for updated criteria
* Appoint ABET Board of Delegates members (3)
* Visit 125 programs, 34 new, 34 non-domestic
* Explore interest in 2-year program accreditation

**CSTA**

* Continue expansion of the CSTA Continuing Teacher Professional Development Pipeline project (CPD), funded by a grant from Infosys Foundation (starting year 2 of 3).
* Promote the release of the 2017 CSTA K-12 CS Standards.
* Continue the CSTA Chapter Revitalization Plan, begun in 2017 and supported by Google.
* 2018 Cycles of the Infosys Award for Teaching Excellence in CS and the Cutler-Bell Prize.
* 2018 CSTA Annual Conference in Omaha, Nebraska.

**Cybersecurity curriculum effort**

* Presentation at the ACM Education Council August 3-4, 2017
* Presentation at the Americas Conference on Information Systems (AMCIS) - August 10-12, 2017, Boston, MA
* Continue to engage cyber community, industry advisory board, and global advisory board
* Endorsements from ACM, IEEE, and AIS
* Final version scheduled for release in December 2017
* Dissemination, e.g.:
	+ ACM Digital Library
	+ Presentation at SIGCSE 2018 in Baltimore, February 2018.
	+ Appropriate cybersecurity conferences and venues

**Data Science curriculum effort**: Depending on the availability of funding and the decisions of the ACM education leadership, the effort will continue work along the two different, but connected paths discussed above. Specifically, the narrower, computing-focused initiative has not been launched (or even planned) yet, but it will be on the agenda of the Education Board/Education Council early in the 2017-18 year. The broader, collaborative effort to articulate and clarify the space of data science education has currently limited remaining NSF funds from the original workshop project to get the work started; its continuation will depend on the effort’s success in engaging the societies and seeking additional funding.

**Diversity taskforce**: Once the survey results come in, Mark Nelson has agreed to share the survey results with the Diversity Taskforce. The Taskforce must then decide, based upon the results, how to proceed.

Lisa has been informed that she has rotated off the Education Council, thus the Task Force will need to choose new leadership. As of this writing, Lisa continues to serve as the US representative on the CSTA International Committee and therefore will be available as liaison on an as needed basis.

**Educational efforts in China**

(1) Sponsor an annual computer education conference in China

(2) Promote NSFC research funding for Computer Science Education

(3) CCF Computing Curricula

**Educational efforts in India:** Next year we plan to extend CSPathshala to 50 schools, conduct 5 more FDPs and create sample curricula for other subjects.

**Information Technology 2017 (IT2017):** Next year’s work effort will focus on the dissemination of the report:

Publications in conference proceedings, presentations at international conferences, and dissemination via the *Inroads* magazine over the past year (July 2016 - July 2017) include:

* Impagliazzo, J., Cuadros-Vargas, E., Escobedo, G.B., Miranda del Solar, J.J., Sabin, M., and Viola, B.. 2016. Latin American Perspectives and the IT2017 Curricular Guidelines. In *Proceedings of the 2016 ACM Conference on Innovation and Technology in Computer Science Education* (ITiCSE '16). ACM, New York, NY, USA, 166-167.
* Sabin, M., Viola, B., Impagliazzo, J., Angles, R., Curiel, M., Leger, P. Murrilo, J., Nina, H., Pow-Sang, J.A., and Trejos, I. 2016. Latin American Perspectives to Internationalize Undergraduate Information Technology Education. In *Proceedings of the 2016 ITiCSE on Working Group Reports* (ITICSE-WGR '16).
* Sabin, M., Peltverger, S., Tang, C., and Lunt, B. 2016. ACM/IEEE-CS Information Technology Curriculum 2017: A Status Update. In *Proceedings of the 17th Annual Conference on Information Technology Education* (SIGITE’16).
* Alrumaih, H., Hawthorne, E., Impagliazzo, J., and Timanovsky, Y. 2017. EduBits. *ACM Inroads* 8, 2 (May 2017), 9-12. DOI: <https://doi.org/10.1145/3078326>.
* Sabin, M., Peltsverger, S., Paterson, B., Zhang, M., and Almuraih, H. 2017. IT2017 Report: Putting It to Work. Accepted in the *Proceedings of the 18th Annual Conference on Information Technology Education* (SIGITE’17).
* With help of the Executive Committee member Ming Zhang, the task group will have a Chinese translation of the report.
* SIGITE’17 (Rochester, NY, October 4 - 7, 2017) will be the first dissemination opportunity of the IT2017 final report through a panel discussion.
* In 2018, task group members plan to prepare paper and panel submissions at SIGCSE, ITiCSE, IFIP World Conference on Computers in Education, Western Canadian Conference on Computing Education, and similar conferences in China and Latin America.

The domain name <http://it2017.acm.org> will continue to be used to feature a web site that updates on dissemination efforts and relevant future developments in IT education.

**Enterprise Information Technology Body of Knowledge (EITBOK):** IEEE Computer Society will develop a marketing plan within the next few months and will begin executing that plan in 2018.

**Learning at Scale:** Planning for the 2018 conference has gotten into full swing. The Program Chairs for Learning @ Scale 2018 are Ken Koedinger (CMU) and Scott Klemmer (UCSD). The conference will be located in London, UK, co-located with the International Conference of the Learning Sciences (ICLS) and the International Conferences on Artificial Intelligence in Education (AIED). The exact dates for the conference are still being determined, but it will likely be in late June, 2018.

**Master’s of Science in Information Systems 2016 (MSIS2016):** The key focus of the 2017-18 year will be to promote and disseminate the results of the project and develop mechanisms for supporting the users of the competency model.

**NDC survey**: Review feedback from the 2016 study; prepare and conduct the survey in fall 2017 and report results in *ACM Inroads* in 2018. Consider preparing a more comprehensive analysis of multi-year NDC data for publication. Work with the CRA Enrollment Survey Committee as required for production of their remaining articles for *ACM Inroads*.

**Retention taskforce**

* Receive the final, anonymized, relevant data set from NCWIT
* Undertake collaborative analysis of the data with NCWIT
* Write and publish three op/ed pieces and one column for *Inroads* magazine
* Create and submit a session proposal for SIGCSE 2018
* Write and publish a final report on the project with recommendations for next steps (date still to be determined based on data analysis)

**SIGCAS**: SIGCAS held elections and a new executive committee is in place. This committee will appoint y replacement to the Ed Council sometime late in the 3rd quarter or early in the 4th quarter of 2017.

**SIGGRAPH**: The SIGGRAPH Education Committee plans to focus on outreach, curriculum study, and Computer Graphics Educational Material Sources (CGEMS) next year. Accordingly, during this year's Education Committee meeting scheduled July 30; curriculum, CGEMS, and conference-related working groups will be organized and planned during scheduled breakout work sessions.

Also during next year, we will conclude our ongoing curriculum study of CS+X where X=Computer Graphics programs, such as Animation, Digital Arts, Computing in the Arts, New Media, Media Technology, etc.; and draft a final report. We will identify a representative for the CC2020 effort. And finally, we will create a Nifty Assignments track for SIGGRAPH modeled after SIGCSE's Nifty Assignments.

Susan Reiser will replace Ginger Alford as ACM Education Council Rep

**SIGHPC**: The Computational & Data Science Fellowship program will continue for the next three years. The SIGHPC Education chapter has initiated a second “Community Speaks” webinar series to discuss the challenges of producing a workforce with expertise in this important area. In addition the chapter will continue to provide informational webinars on various training activities, academic programs, and emerging tools related to this broad set of educational efforts.

**SIGITE**

* Scheduled Conferences
* 2018 in Fort Lauderdale, FL, hosted by Broward College
* 2019 in Provo, Utah, hosted by Brigham Young University
* Build on SIGITE/RIIT conference success
* Strong core of participants, enthusiastic volunteers
* SIGITE/RIIT Best Paper and Best Student Paper awards
* IT Chairs meeting
* Vendor workshops
* New sponsors
* Standing Conference Planning Committee
* Continued support for the IT2017 Report
* 4 SIGITE members on the IT2017 Task Group
* Dissemination at 2015, 2016, and 2017 SIGITE conferences
* Panel at SIGITE 2017: IT2017: Putting to Work
* Membership participation in the IT2017 call for public comment: v0.51, v0.61, v0.85 Issues
* How to increase membership of IT faculty in Community Colleges
* How to increase student participation in the SIGITE/RIIT conferences
* How to encourage and support IT research