Computer Engineering Review Task Force Report

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SUMMARY
In early 2011, the ACM and the IEEE Computer Society (IEEE/CS) created the CE2004 Review Task Force (RTF) and charged it with the task of reviewing and determining the extent to which the document "Curriculum Guidelines for Undergraduate Degree Programs in Computer Engineering," produced 2004 December 12 and known as CE2004 [1] required revisions. The RTF submitted a report to both societies in July of 2011. The report summarized a survey of academic and industry constituents conducted by the RTF. It recommended keeping the structure and the vast majority of the content of the original CE2004 document. However, it also recommended that contemporary topics should be strengthened or added while de-emphasizing other topics that appeared to be waning from the curricular mainstream of computer engineering. Additionally, the RTF recommended that the two societies form a joint special-purpose committee to update and edit the earlier document and to seek input and review from the computer engineering industrial and academic communities through presentations and workshops co-located at major conferences. The presenters of this special session were members of the 2011 RTF and two presenters were members of the original curricular task force from 2004. The presentation will provide insights in the RTF findings and thoughts on how a future computer engineering report might evolve.

Categories and Subject Descriptors
K.3.2 [Computers and Education]: Computers and Information Science Education – *Curriculum*

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General Terms
Standardization, Human factors

Keywords
Computer engineering, curricular report, education, ACM, IEEE Computer Society

1. OVERALL OBJECTIVE
The primary objective of this session is to present to the computing community the progress made by ACM and the IEEE/CS in transforming the existing "Curriculum Guidelines for Undergraduate Degree Programs in Computer Engineering," also known as CE2004 to a new and contemporary report. A secondary objective is to solicit input from the computing community on ways to improve the existing report so that it is current and reflects the state-of-the-art of the practice of computer engineering. The presenters from both ACM and IEEE/CS represent all six members of the RTF.

The RTF developed and sent survey invitations to 20,000 industry and academic constituents in the computer engineering field. The RTF also contacted some ABET industry program evaluators to solicit their input. In all, the TF received 14 industry responses and 263 academic responses. Although the survey default was anonymity, respondents had the option of providing contact information in case they were interested in having further input on the revisions; 10 industry and 51 academic respondents provided contact information. Some new or expanded technical skill suggestions derived from the survey included areas of networking, software engineering agile methods and tools, embedded system design, parallel programming, and hardware/software co-design.

The RTF found that the majority of what the constituencies believe is important is already covered well in CE2004. However, the RTF did identify significant deviations that could guide the revision process toward a document that is appropriately forward

looking given the continuing changes in the computer engineering landscape.

The RTF recommended that a team of volunteers lead the revision effort beginning in fall of 2011 with interim updates as necessary. The RTF largely affirmed the contents of CE2004 compiled nearly a decade ago. However, the RTF recognized that several advances have occurred during that time. It recommended that the societies form a new core research and writing special committee of eight to twelve members derived from ACM and IEEE/CS members to include representatives from academia, industry, government, and community college groups. The special committee should make key drafts of their revisions available to a wide constituency, including all respondents to the survey who expressed interest in having further input. The special committee should make efforts to include key conferences from outside of the United States.

2. OUTLINE OF SESSION

The session includes some introductory remarks and an overview of the project by the session moderator. The five remaining participants will present individual presentations surrounding the work of the task force. A robust interaction with the audience will be an integral part of the session. The presenters will distribute summary handouts during the session. Presentations are as follows.

Dr. John Impagliazzo, a member and principal co-author of CE2004 committee and RTF member, will present a brief overview of the CE2004 document. He will describe the evolution and components of the 2004 report and focus on its body of knowledge.

Dr. Eric Durant, the de facto leader of the RTF, will summarize the six-month activities of the group. He will focus on the organization of the task-force challenges and the strategies used to overcome them.

Dr. Mitch Thornton, RTF member, will continue the discussion on the work of the RTF. He will focus on the results of the surveys and contrast the suggestions received from industry with those received from academia.

Dr. Tim Wilson, RTF member, will discuss the activities of the special committee formed jointly by ACM and IEEE/CS. He will address the trials the group is facing or will face and highlight the actions the special committee plans to take to meet those challenges.

Dr. Susan Conry, chair of the Engineering Accreditation Commission of ABET and RTF member, will discuss how the computer engineering curriculum complements the current ABET criteria. She will highlight the essential elements of the criteria and show how the new curriculum satisfies those criteria.

Dr. Andrew McGettrick, a member of the CE2004 committee, chair of the ACM Education Board, and RTF member, will describe the way ahead and the activities expected to take place over the next two years.

3. EXPECTATIONS

The expected audience is computing educators who have an interest in computing curricula, particularly as it affects the computer engineering field. Audience participants will acquire greater familiarity with ACM and IEEE/CS joint efforts to produce an updated coherent document that benefits a large component of the computing field. The presenters will elicit feedback from the audience via a brief survey on a few topics to enhance the quality of the final report.

4. SUITABILITY

This presentation reflects a report of an effort that is a work-in-progress. The outcome of the effort will be an updated, contemporary curriculum recommendation endorsed jointly by the ACM and the IEEE/CS. Since the work is in a state of transition, it is more suitable as a special session rather than a panel or a paper on the summary of results. Indeed, suggestions and written commentary from the audience will receive full consideration by the joint special committee.

ACKNOWLEDGEMENTS

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REFERENCE

[1] D. Soldan. 2004. “Curriculum Guidelines for Undergraduate Degree Programs in Computer Engineering,” CE2004. Retrieved 2011 August 23 from http://www.acm.org/education/education/curric_vols/CE-Final-Report.pdf