The Crisis in Computing
--
and is there something we can do about it?

Duncan A. Buell

Department of Computer Science and Engineering
The University of South Carolina
What’s Gone Wrong With Computer Science?
What’s Gone Wrong (1)?

We are not a “core” STEM discipline

We are connected to S, T, E, and M, but not wholly contained inside any of these

We are also much more technical than “just business”

We are scattered among several university units
What’s Gone Wrong (2)?

The job market is too good

The job market complicates the 2-year/4-year issue

We have been too successful
  Hardware is fast/cheap/powerful
  Software is very powerful
  Computers can be seen to be magical
  Kids don’t think of computers as unfinished products
What’s Gone Wrong (3)?

“Computer science” versus “computer literacy”

AP CS is a “math” subject

All other courses are “business” subjects

Endorsement but not certification of teachers
What’s Gone Wrong (4)?

SC “Pathways” brochure for STEM (cover) (text)

SC “Pathways” brochure for IT (cover) (text)

NSB report on science teachers

South Carolina’s “computer science” requirement
Is South Carolina an Anomaly?
I suspect not...
Can We Fix the Problem?
Do we have a choice?
Some First Steps
At Least Some First Steps

New (maybe?) SC “Pathways” STEM brochure

New (maybe) SC “Pathways” IT brochure
Changes That Might Help
Suggestions for Change

Give computer science an “identity”—create a (virtual) Computer Science Department in all schools—and create a CS major

Get the courses labeled properly
  
  Literacy
  
  Computer science and computer programming
  
  Applications
  
  Hardware and systems

Get the university/technical college roles clarified in the minds of students and parents
Suggestions for Change

Push literacy to the middle school level (ACM/CSTA Level I)

Develop a good ACM/CSTA Level II course as the default “computer science requirement”

Establish a better path for teacher preparation

Get business behind the changes!
The Game Plan

University expertise for the intellectual background of the discipline

High school and College of Education involvement for the process issues

Business/industry backing for justification
www.cse.sc.edu

info@cse.sc.edu

Department of Computer Science and Engineering
University of South Carolina
Columbia, South Carolina 29208
803.777.2880
The End
Things I Tell Students
The World Changes

Compared to my university’s computer when I was a graduate student, my laptop is

15,000 times cheaper
10,000 times physically smaller
with 500 times more memory
and 1000 times more hard disk
and is 1500 times faster

Storing Microsoft Vista on a disk takes about 1.4 million times more space than was present on the lunar landing module on 20 July 1969.
The Basic Game Plan

1. A solid technical background – because you won’t be able to fake it.

2. The ability to read, write, and present technical information – because the CEO is likely to be a nontechnical person.

3. The ability to work with people – because nearly all projects are bigger than just one person can do.
What’s Your Second Favorite Thing?

Most people don’t just work on the computer—they use the computer to do something else.

Computer engineers deal with computing hardware, real-time, and the outside world.

Business applications people do business.

Computer scientists can do music, science, animation/graphics/art, biology, law, ...
Your Goals

Not just to be trained and get Microsoft/Oracle/Cisco certifications

But to be *educated* in computing

Not to learn to be a lifelong programmer

But to know programming so you can *manage* programmers ten years from now

Not to be trained on today’s Package A

But to learn how to re-educate yourself with Package B in 2008, Package C in 2009, Package D in 2010, ...
The End