



CS 4 ALL

Reaching Out to K-12 Teachers to
Broaden Interest in Computing

Tom Cortina
Associate Teaching Professor
Carnegie Mellon University





My Path & The Big Question

- 22 years of teaching undergraduate CS
 - Polytechnic University (now NYU-Poly)
 - Stony Brook University (SUNY)
 - Carnegie Mellon University
- What is “Computer Science”?
 - Much more than computer programming or computer applications
 - Why don’t we have an appealing course to show the breadth of CS like physics or biology has?





My Broader Impact Focus

- How can we expose all students in K-12 (and non-majors in college) to the breadth and possibilities of studying CS?
- Motivation:
 - Drop in enrollments in CS programs nationwide in the 2000s.
 - Emphasis on programming language skills in CS AP.
 - Need for broader interest in CS.





My Broader Impact Activities

- CS4HS Teacher Workshops
 - Started at CMU in 2006, primarily financed by Google
 - Provides computing/AP teachers with materials to use in their courses to show students the breadth of CS.
 - Expose teachers to cutting edge research that they can describe to their students.
 - Builds a larger CS community for isolated teachers.
 - In 2010, Google now supports over 20 workshops in the Americas and about 15 workshops in EMEA.





My Broader Impact Activities

- Computer Science Unplugged
 - Created by Tim Bell, Mike Fellows and Ian Witten.
 - Free activity book for teachers to show how to teach kids about CS principles without using a computer (e.g. binary numbers, algorithms, data compression)
 - Translation into 9 languages besides English.
- ACTIVATE – NSF ITEST grant
 - Workshops in Alice, computational thinking, and Java for STEM HS teachers in PA, WV, OH, MD





Connections

- Developed a new non-major intro course at CMU titled Principles of Computation to explore the main aspects of CS
- Material from this course is used in CS4HS and ACTIVATE
- Material from CS Unplugged is used in my own teaching





A GOOD Activity is ...

- An activity that is accessible to a general audience that does not necessarily have the same background as we have.
- An activity that can be replicated easily by others to reach an even larger population.
- An activity that shows the relevance of your discipline and increases interest, especially to the next generation.





My (CS) Advice

- In addition to research in a formal technical area, consider publishing your educational efforts in venues such as:
 - SIGCSE (I am symposium co-chair for 2011)
 - ITiCSE, ICER, FIE, ASEE Conference, CCSC
- Join ACM SIGCSE and CSTA (Computer Science Teachers Association)





Join Us!

- Visit these websites to get more information or join the effort to promote broader CS education in K-12

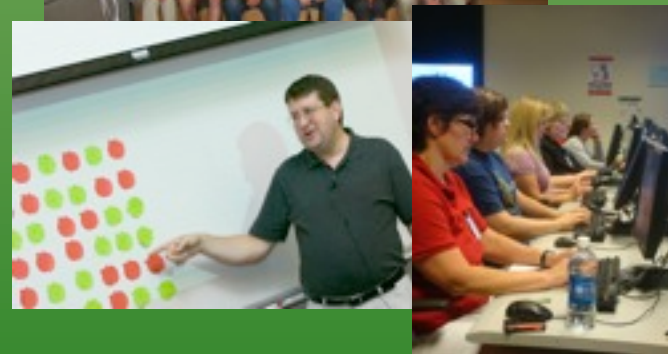
www.cs4hs.com

www.csunplugged.org

www.cs.cmu.edu/activate

www.sigcse.org/sigcse2011

csta.acm.org



Broader Impacts For Research and Discovery Summit

Tom Cortina
Carnegie Mellon University



Contact Me!

- Tom Cortina
Computer Science Department
Carnegie Mellon University
Pittsburgh PA
tcortina@cs.cmu.edu

