

# Project “Georgia Computes!”

## An NSF Broadening Participation in Computing Pipeline Alliance

<http://www.georgiacomputes.org>



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### What we do:

## Improve and broaden the computing education pipeline across the entire state

- **K-12:** We run workshops and summer camps with youth-serving organizations like YWCA, Girl Scouts, and Cool Girls. We teach high school teachers how to teach CS up to AP classes. We teach other *University System of Georgia (USG)* computing departments



how to run summer camps, and offer them seed funding.

- **Undergraduate:** We teach USG faculty how to offer high-retention curricula. We measure adoption and the impact of the curricula. We measure and study CS enrollment

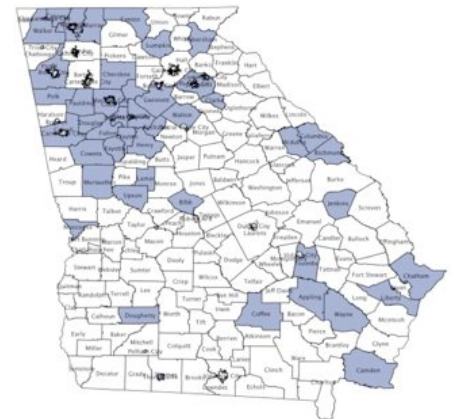
factors. Undergraduates work as leaders and mentors, and in high school classes as STEP fellows.

- **Graduate:** We use graduate students as leaders, mentors, material developers, and evaluators. We track CS graduate enrollment in Georgia.



### Successes:

- We continue to work with State leaders on Georgia’s high school curriculum, on training teachers, on high school teacher CS endorsement, and on APCS counting towards high school graduation.
- Georgia has a larger percentage of high schools offering APCS than any other state in the Southeast. 2010 had the most students ever from Georgia taking the APCS.
- Around half of the CIS programs in the state have now sent faculty to our workshops. 7—10 of 32 CIS programs in the state have changed their approaches. We have gathering evidence of increased enrollment in CS2.
- We sponsored the first African-American, all-girls YWCA robotics team in the state.
- We are documenting the kinds of workshop and camp activities lead to the greatest positive changes in attitudes about computing.
- We have seeded ten new summer camp programs around the state.



School Districts sending Teachers to Georgia Computes! Workshops



## Highlighted Projects for 2010:

**New kinds of workshop curricula:** We continue to develop new curriculum and new approaches that appeal to a diverse range of students. We had found previously that Lego Robotics has not proven as successful as Scratch animations and Alice storytelling for engaging Girl Scout participants. However, we have found that programming the Pleo robot dinosaur has had an enormous impact, giving us a new kind of robotic intervention to engage girls. We are also developing curriculum for wearable computing.



**Glitch! Game Testers:** A BPC Demonstration Project has worked with 25 African American male high school students, leveraging their passion for gaming into an interest in computing. High school students work as a Quality Assurance (QA) team, full-time in the summer and part-time during the school year, testing pre-release games for companies such as Yahoo! Games, Cartoon Network, and Last Legion Games. In addition to testing in their first year in the program students attend CS workshops using Alice and Python, in the second year they take Advanced Placement CS classes. Of the seven who graduated from high school, six are attending college, and five of them in computing related fields. Only one of those seven students started the program with an interest in computing as a college major. Glitch is a partnership between Georgia Tech and Morehouse College, with undergraduates from both schools working as researchers and teachers.



**Disciplinary Commons for Computing Educators (DCCE):** Funded by NSF CPATH, the DCCE brings together high school and university teachers of introductory computer science. They share methods, reflect on their practice, observe each others' classes, learn about the issues of each level, and how to support students in transitioning between them. The DCCE in 2010 includes teachers from across the Southeast, and introduces the Computing Commons Collaboration Conference to create new opportunities for communication in a community of local computing educators.

**Statewide Evaluation: Where have they gone, and where are they coming from?** In our two year extension, we are making a statewide effort to track the influences on students enrolling in computing.



19 of the 29 USG institutions with computing departments participated in our survey. We have found that the high schools with *Georgia Computes* trained teachers (36% of all Georgia public high schools) generate 64% of the students in CS1 who come from Georgia. GC schools produce significantly more female introductory CS students than non-GC school. Significantly more white intro CS students come from non-GC schools, meaning that significantly more under-represented minority students come from GC schools. Our greatest impact on CS1 enrollment through high schools. Students who took our workshops and summer camps are a relatively small percentage of students in CS, but

most of the students in CS1 had some high school computer science courses. Studies in 2010 and 2011 are taking detailed look at the influences on student enrollment, including students' understanding of the field and how students see computing as a way "to help people or society" (a significant factor for Female and Black respondents).

