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**Title:** Could Scratch be the only language in an introductory computer science course?

**Abstract:** Scratch has proven an effective way to introduce programming in college level introductory computer science classes for both majors and non-majors. Scratch's interactive nature and lack of syntax allows students to get results quickly, while focusing on problem solving and learning transferable programming concepts. Typically, Scratch is used only for a short while before switching to a text-based language such as C, Java, or Processing. But could Scratch -- or some variant of it -- be used to teach a full-length, programming-heavy computer science course? If so, for what type of classes is it best suited (CS0, CS1, ...)? If not, what's missing? When should students transition to another language, and can that transition be made smoothly?

**Significance and Relevance of the Topic:** This question came up during the Q&A of the Scratch panel at SIGCSE 2009. At the time, it seemed that the answer was clearly "no". However, in the fall of 2009, Brian Harvey and Dan Garcia taught a programming-heavy computer science course for non-majors using Scratch and a Scratch variant called BYOB. In addition, Ursula Wolz and her colleagues at The College of New Jersey have used Scratch not only as an efficient way to learn programming fundamentals, but also as a way to prototype multimedia projects throughout the semester in classes ranging from CS0 through CS1/CS2 and a 400-level games course. In light of these experiments, it is worth re-visiting this question.

**Expected audience:** I expect the audience to be mostly college level educators interested in new ways to teach introductory computer science. I expect 20 to 30 people.

**Discussion Leaders:** In addition to myself, the discussion will be lead by Dan Garcia and Brian Harvey, UC Berkeley; Henry Leitner and David Malan, Harvard; and Ursula Wolz, The College of New Jersey. We have different points of view on this topic, so the discussion promises to be lively.

**Expertise of Discussion Leaders:**
- **Dan Garcia** and **Brian Harvey**, both Lecturers with Security of Employment in Computer Science at the University of California, Berkeley, co-taught a Scratch-based CS0 using Scratch in the fall of 2009. Dan is on the CollegeBoard AP Computer Science Advisory Group that is investigating a new CS0 course and is a faculty co-advisor for BFOIT, a local Bay Area outreach program where middle school students can learn Scratch. Brian wrote the *Computer Science Logo Style* trilogy intended for teens and teaches Scratch to fourth and fifth graders in an after-school class at a local elementary school.
- **Henry Leitner**, Associate Dean of Information Technology, Chief Technology Officer for the Division of Continuing Education, and Senior Lecturer in Computer Science at Harvard University, teaches "Great Ideas in Computer Science," a course that introduces students to programming first via Scratch and then via Java. **David Malan** is a Lecturer on Computer Science at Harvard, where he introduces 300 undergraduates to programming each year by way of Scratch and, shortly thereafter, C.
- **John Maloney**, a Research Specialist at the MIT Media Lab, is the software architect and lead developer for Scratch. **Ursula Wolz** has published extensively on the CS undergraduate core. She has taught that core in Pascal, Scheme, Mathematica, C, C++, Java, and Actionscript. Currently she is using Scratch as an introduction followed by Processing (an overlay for Java targeted toward artists).

**Special Requirements, if any:** A video projector would be nice, although not essential.