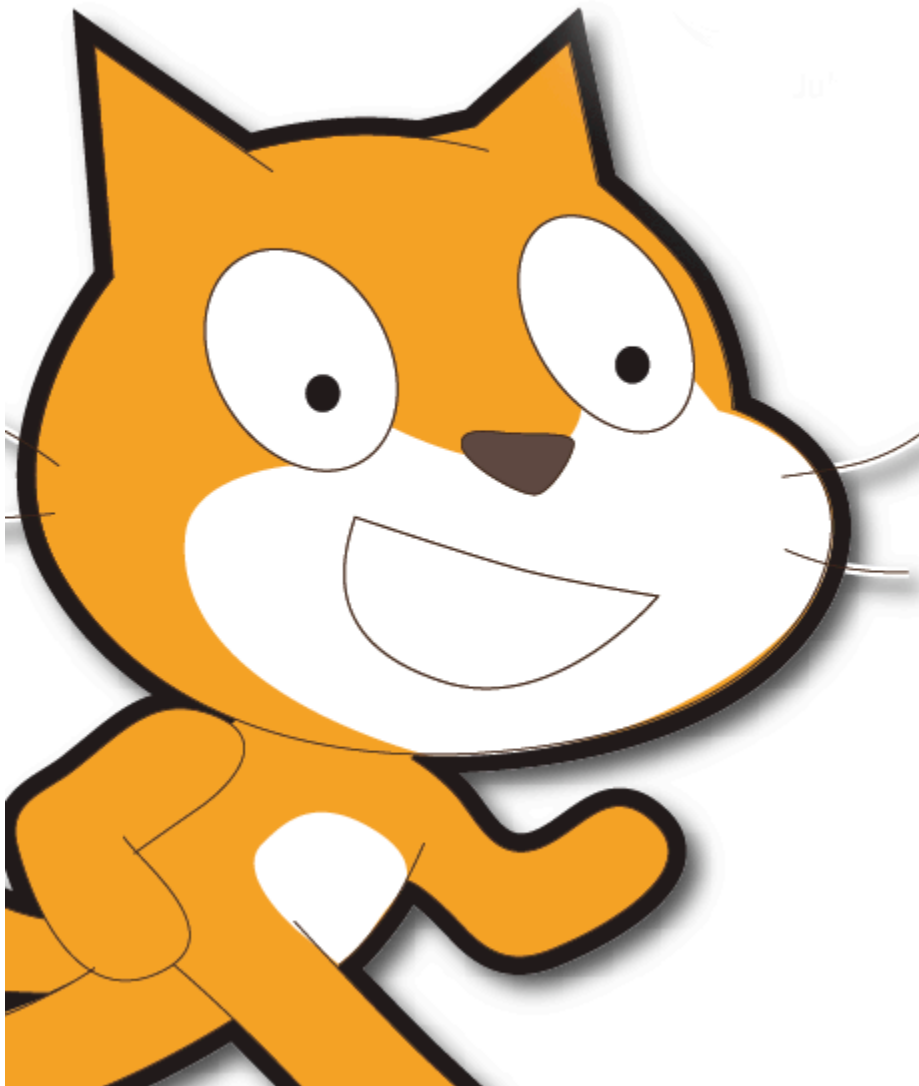


SCRATCH @ MIT

July 24-26, 2008



Thursday, July 24

8:30 Registration and Continental Breakfast

9:00 **Welcome and Keynote Session**

Sowing the Seeds for a More Creative Society

Mitchel Resnick, Professor of Learning Research, MIT Media Lab

Imagine-Program-Share: Stories from the Scratch Online Community

JSO, Belgium

MyRedNeptune, Russia

SonicPops, England

Wodunne, United States

Moderators: Karen Brennan and Andrés Monroy-Hernández, MIT Media Lab

10:30 Break

11:00 **Concurrent Sessions**

Bartos Theatre **Play, Learn, Transform (aAta, pAta, hoArata)**

Geetha Narayanan, Padmini Nagaraj, Dipti Sonawane, Palash Mukhopadhyay, Kinnari Thakkur

Wiesner Room **Scratching All Itches Equally**

Gregory Rosmaita, Liddy Nevile, Jutta Treviranus

de Rothschild Room **Introducing Computer Science from Scratch**

Michael Littman

Prototyping Simply with Scratch

Lance Vikaros, Jonathan Vitale

Scratch @ Harvard

David Malan

Room 135 **An Adaptive, Guided-Discovery Learning Spiral to Enhance Technological Creative Performance for Students with Different Learning Styles**

Tracy Ho, Yao-Ting Sung

Scratching in Mexico

Jeanene Bluhm de Carvajal

Desert-Dwelling Australian Aboriginal Children Scratching Their Choice to Learn

Krystof Haber

The Cube **Trying Out (and Thinking About) Different Ways of Introducing Scratch**

Jay Silver, Eric Rosenbaum

12:00 Lunch

1:30 **Concurrent Sessions**

Bartos Theatre **It Might Be Computer Science But It Isn't Fun!**

Ursula Wolz, Monisha Pulimood, Chris Dunne, Nikhil Pulimood

Wiesner Room **Creating Change: Educational Ideas and Scratch**

Natalie Rusk, Karen Brennan

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Stefanie Mayer, Gottfried Mayer

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How to Get Girls Involved in Game Programming Using Scratch

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Room 135 **Scratch in the Elementary School**

Lee Appelbaum

Comparing Notes: Misconceptions in Scratch

Colleen Lewis

Scratch vs. MicroWorlds

Mark Werness

The Cube **Embedding Scratch into the School Curriculum**

Bharat Shah

2:30 Break

3:00 **Concurrent Sessions**

Bartos Theatre **Designing Scratch: Past, Present, Future**
John Maloney, Natalie Rusk, Brian Silverman

Wiesner Room **Scratch Solutions for Urban Schools**
Dan Cogan-Drew, Annjanette Bennar, Venice Sterling, Quenton Narcisse, Hector Guzman

de Rothschild Room **COMPUGIRLS' Experience with Scratch**
Kimberly Scott

Room 135 **Scratch as Groupware**
Timo Goettel
λ - Scratch
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Scratch as a Game Design Teaching Tool: Benefits and Limitations
Stephen Howell

Room 235 **Digital Fluency and Its Importance in Educating Young Students for the Knowledge Age**
Razvan Bologna
Computational Concepts for Transition Year Students Using Scratch
Clare McInerney
Mental Models, Programming Aptitude, and Scratch
Tina Götschi

The Cube **2 minutes and 10 seconds**
Keith Braafladt

4:00 Break

4:30 **Demonstrations**

Participants may set up demonstrations on tables located in the upper atrium. The sign-up sheet for table space will be available during lunch on Thursday at the Registration Desk.

5:30 **Dinner in the Courtyard**
Vegetarian-friendly Barbecue and Ice Cream Social

7:00-8:00 **The High-Tech Magic of Seth Raphael**

This modern day miracle show will leave people wondering: Was that real magic, really technology, and is there any difference at all? Seth Raphael does the impossible in his new show, "The Online Magician." Time machines, wireless power, and telepathic computers all make an appearance in this wonder-filled, thought-provoking show. Illustrating the importance of a magical perspective in an ever-more-technological age, Seth does not shy away from an honest critique of scientists, modern day shamans, or even magicians as he performs modern miracles. Seth Raphael envisions the future of technology as only a magician can.

Friday, July 25

9:00 Registration and Continental Breakfast

9:30 **Concurrent Sessions**

Bartos Theatre **The Evolution of the Scratch Website and Community**
Andrés Monroy-Hernández, Karen Brennan, Jens Moenig, Mark Goff

Wiesner Room **Library as Possibility Space: A Constructionist Framework**
Jennifer Nelson, Keith Braafladt, Brian Myers

de Rothschild Room **African Folk Tales Retold**
Barb Tennyson
Synergistic Effects of Enacting, Visualizing, and Manipulating Codes in Scratch to Promote Understanding of Programming and Mathematical Concepts
Margaret Chan, John Black, Cameron Fadjo, MingTsan Pierre Lu, Jiwon Shin
Storytelling with Scratch
Jill Pears

Room 135 **It's Elementary: Scratch**
JoNelle Gardner, Audrey Cageao, Patty Granger
A Website to Disseminate Scratch Using Video Tutorials: LearnScratch.org
Juan Carlos Olabe, Christine Rouèche
Scratch in Russia
Yevgeny Patarakin

The Cube **Scratch Cards for Scratch Boards**
Marty Billingsley

10:30 Break

11:00 **Concurrent Sessions**

Bartos Theatre **Social Creativity and Meta-Design: Exploiting the Long-Tail for Design, Learning, and Collaboration**
Gerhard Fischer

Wiesner Room **Scratch in the Interactive Journalism Institute for Middle School Students**
Ursula Wolz, Kim Pearson, Mary Switzer, Monisha Pulimood, Meredith Stone

de Rothschild Room **Various Ways to Bridge Real and Virtual Worlds**
Kazuhiro Abe
Starting from Scratch: Early Experiences from the Lajedos Site Museum
Roger Meintjes
GamePad
Keith Braafladt

Room 135 **The Pedagogy of Children's Digital Art**
Phoebe Hui
Pitfalls of Scratch in an EFL Setting in Taiwan
Ruth Martin
Situating the New Media Literacies Skills in Scratch
Andres Lombana

Room 235 **Harnessing the Power of Scratch to Teach Math Concepts**
Colin Meltzer
Scratching the Maths Itch
Jane Harris
Scratch: Patching the Digital Divide
Jennifer Wardell, Emilie Reiser

The Cube **ScratchEd**
Karen Brennan

12:00 Lunch

1:30 Concurrent Sessions

Bartos Theatre **Sharing Issues: Intellectual Property and Scratch**
Dan Pote, Wendy Seltzer, Judith Donath, Andrés Monroy-Hernández

Wiesner Room **What Exactly Are Kids Learning in Scratch? Observations from the Clubhouse**
Kylie Pepler, Yasmin Kafai

de Rothschild Room **Scratching Is Elementary, My Dear**
Sharon Neff
Disabilities and Scratch
Rafael Sánchez-Montoya, Carmen López-Escribano
Empowering Students Through Powerful Contexts: Adaptive Technology
Karen Randall

Room 135 **Using Scratch to Learn with Technology**
Jeff Boyer
A Case Study: Integrating Scratch in the Curriculum of the Public and Private School Systems in Memphis, Tennessee
Juan Carlos Olabe, Christine Rouèche
Scratch Me!
André Williams, Alec Julias

Room 235 **Scratch in Computer Science 1**
Inés Kereki
Getting the Itch with Scratch
Jeff Parker
HCI Alternatives Using the Nintendo Wii
Leanne Ross

The Cube **Creative Collaboration with Scratch: A Media Art Performance Approach**
Seung Joon Choi

2:30 Break

3:00-4:30 Keynote Session

Learning to Design, Designing to Learn
Geetha Narayanan, Founder and Director, Srishti School of Art, Design, and Technology
John Maeda, President, Rhode Island School of Design
Moderator: Mitchel Resnick, MIT Media Lab

Saturday, July 26

9:00 Continental Breakfast

9:30 **Self-Organizing Workshops**

These self-organizing workshops will give participants the opportunity to arrange informal workshops and meetings to explore mutual interests, discuss shared issues, collaborate on hands-on projects, and plan joint initiatives. Sign up is on a first-come, first-served basis. The sign-up sheet will be available on Friday morning in the lower atrium.

10:30 Break

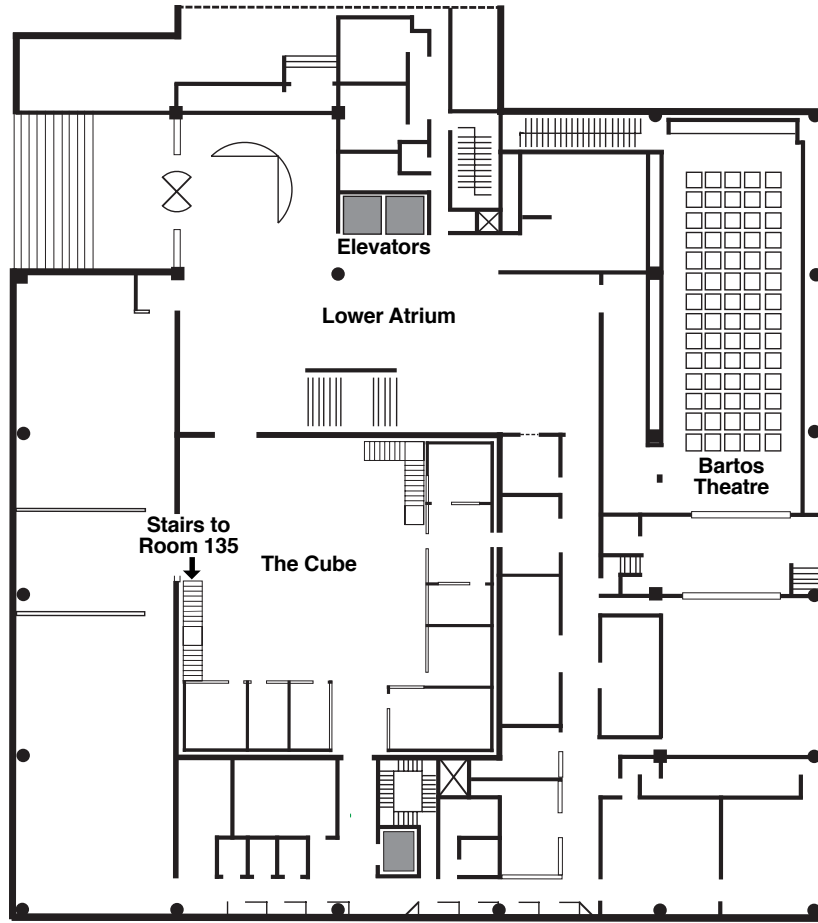
11:00 **Self-Organizing Workshops**

12:00 Lunch

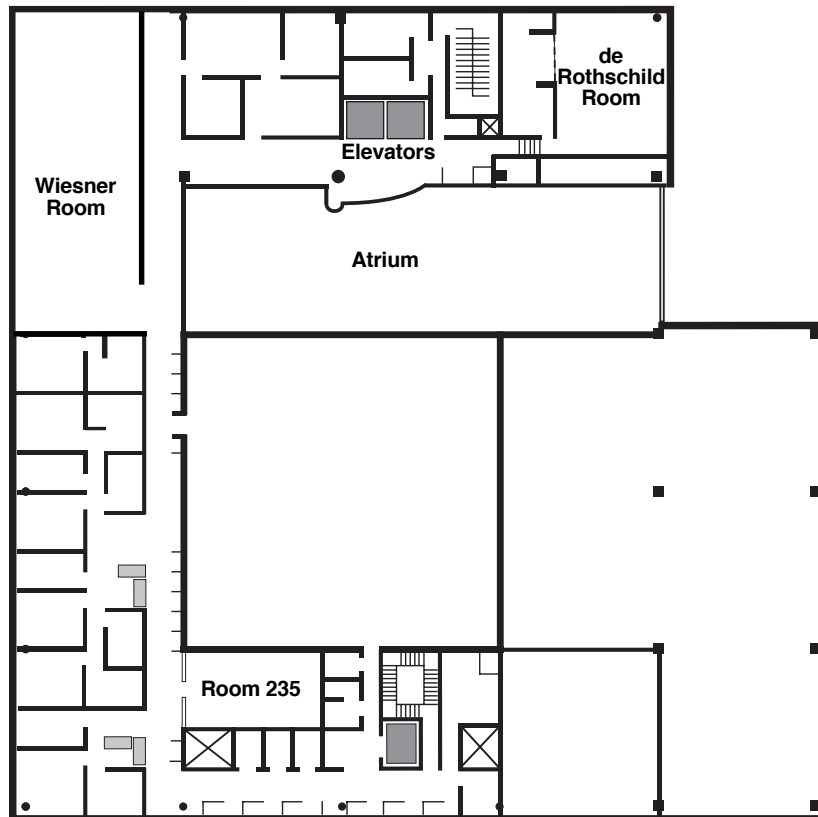
1:30 **Self-Organizing Workshops**

2:30-3:00 Community Discussion in Bartos Theatre

Lower Level



Second Floor



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Welcome!

In the year since we launched Scratch, we've been continually surprised. We've been surprised by the level of activity: more than 160,000 projects have been uploaded to the website, with a new project now arriving every two minutes. We've been surprised by the sophistication of the projects: many of them go beyond what we thought was possible. We've been surprised by the degree of collaboration: more than 15% of the projects on the website are "remixes" of other projects. And we've been surprised by the diversity of projects: people are creating new genres of projects that we never imagined.

Underlying the success of Scratch is the dynamic community of young people who have embraced Scratch as a new medium for creative expression. But the future success of Scratch depends equally on the development of another community—a community of educators, parents, and researchers who see Scratch as a catalyst for rethinking and transforming the ways people create, collaborate, and learn.

Scratch@MIT provides an opportunity for this community to come together, to share ideas and experiences with one another, and to imagine new possibilities for Scratch. Our team from the MIT Media Lab will be discussing some of our future plans for Scratch—but, even more important, we are looking forward to learning from you, to hearing your stories, suggestions, hopes, and dreams for Scratch.

So, in the spirit of Scratch, we hope you'll use this conference as an opportunity to imagine and share. Free up your mind, question your assumptions, explore new directions, make new connections. Together, as a community, we have a rare opportunity to bring about meaningful change. Let's take advantage of it.

Mitchel Resnick
Professor of Learning Research
MIT Media Lab

Keynote Sessions



Sowing the Seeds for a More Creative Society

Mitchel Resnick, Professor of Learning Research, MIT Media Lab

Scratch is more than a programming language, more than a website, more than an online community. Its ultimate goal is to help people develop as creative thinkers—helping them learn to design creatively, analyze systematically, and work collaboratively. Mitchel Resnick opens the conference with an overview of the ideas and philosophy that inspired Scratch, highlights and surprises from the first year of Scratch, and plans and visions for the future of Scratch.

Imagine-Program-Share: Stories from the Scratch Online Community

JSO, Belgium

MyRedNeptune, Russia

SonicPops, England

Wodunne, United States

Moderators: Karen Brennan and Andrés Monroy-Hernández, MIT Media Lab

Four active members of the Scratch online community meet in person for the first time to share stories and exchange ideas. They discuss why they became involved in the Scratch community, what they created, how they collaborated, what they learned, and what they want to do next.



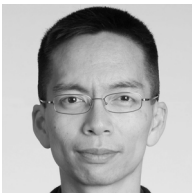
Learning to Design, Designing to Learn

Geetha Narayanan, Founder and Director, Srishti School of Art, Design, and Technology

John Maeda, President, Rhode Island School of Design

Moderator: Mitchel Resnick, MIT Media Lab

The activities of designing and learning are tightly interwoven. In the process of designing, we play with new ideas, explore new concepts, gain new perspectives. Two of the world's most innovative design educators discuss how new media technologies can transform the ways we design and learn—and the ways we think about designing and learning.



Concurrent Sessions, Thursday 11:00-12:00

Bartos Theatre **Play, Learn, Transform (aAta, pAta, hoArata)**

Geetha Narayanan, Padmini Nagaraj, Dipti Sonawane, Palash Mukhopadhyay, Kinnari Thakkur

Building on experiences from our Project Vision initiative in India, we will share our ideas for a new educational framework integrating play and learning. We will discuss our studies of how girls and boys in poor neighborhoods in Bangalore, India, engage with technologies outside of school—and how we are using this research as the basis for new initiatives to enhance learning and well-being within communities, not only in India but around the world.

Wiesner Room **Scratching All Itches Equally**

Gregory Rosmaita, Liddy Nevile, Jutta Treviranus

A discussion of strategies for ensuring that Scratch is usable by all, whether one can see the screen, or use a pointing device or an on-screen keyboard. The goal of the panel is to discuss Scratch's architectural framework to ensure that it is capable of communicating with operating system accessibility APIs, as well as platform-agnostic APIs, such as IAccessible2 and ATK/AT-SPI (Assistive ToolKit/Assistive Technology Service Provider Interface).

de Rothschild Room **Introducing Computer Science from Scratch**

Michael Littman

The essence of computer science is abstraction—the idea that complex processes can be constructed out of simpler ones. Beginning students need a concrete foothold to begin to appreciate this abstract concept. I introduced Scratch in my introductory computer science class at Rutgers University, “Great Insights in Computer Science.” Students quickly became comfortable programming in Scratch and we progressed to more esoteric topics such as algorithm analysis, function growth, and even computability theory, always keeping Scratch as our concrete touchstone. I will briefly outline where we used Scratch in the course and how we will expand on it in future semesters. The goal of the class is to teach deep and important ideas in a friendly, engaging, and non-threatening way, and Scratch is an excellent fit.

Prototyping Simply with Scratch

Lance Vikaros, Jonathan Vitale

Designing software is time consuming. It requires the ability to visualize a dynamic system in advance. Learning how to do this can be challenging, especially for those new to programming. This talk will discuss how Scratch has been an effective learning and prototyping tool in our educational software and video game design classes at Teachers College, Columbia University. We will cover ways in which Scratch can be used to quickly mock-up designs that aid communication, visualization, and testing of ideas before committing to costly development. Informal case studies of students' work will serve as examples of our approach, and we will discuss why we believe that this engages students in authentic communities of practice.

Scratch @ Harvard

David Malan

In the fall of 2008, we deployed Scratch to 280 students in the first week of Computer Science 50, Harvard College's introductory course for majors and non-majors alike. Our motivations were to introduce fundamental constructs (conditions, loops, statements) without the distraction of arcane syntax, provide students with a sense of accomplishment early on, and, ultimately, get students excited. After just one week we transitioned to programming language C. Using Scratch in the course seems to have contributed to both a higher retention rate after the “shopping period” and a greater comfort level for students less comfortable with computers. I'll present on why we used Scratch (as opposed to alternatives), how we used Scratch, and how students (in practice and through surveys) responded.

Room 135 An Adaptive, Guided-Discovery Learning Spiral to Enhance Technological Creative Performance for Students with Different Learning Styles

Tracy Ho, Yao-Ting Sung

In a recent study, we investigated the effects of contrasting strategies aimed at enhancing the creative performance of students through the use of Scratch. The two strategies are the “EDA” (explain-demonstrate-apply) direct-teaching strategy and the “IDSC” (initialize-develop-supplement-create) guided-discovery learning spiral instruction. The result shows that students under the “IDSC” guided discovery learning spiral instruction show better achievement in Scratch technical skills and creative performance. We found that the way children achieve mastery of a new procedure does affect their ability to transfer what they have learned, which contrasts with the results of a previous study. Based on the preliminary results from this recent study we are trying to modify to an “Adaptive IDRC” (AIDRC) by adjusting the teaching strategy and contents to efficiently enhance the creative performance of students with different learning styles.

Scratching in Mexico

Jeanene Bluhm de Carvajal

During our session, we will share how the Thomas Jefferson Institute integrated Scratch in its K-12 curriculum in order to develop creativity in our students. ITJ puts a very special emphasis on creativity, and this is a great opportunity to share our vision of it, and how we measured its increase in our students after using Scratch. Our founder will explain the process of implementing Scratch, how our students are working with it, and how we have linked it to the “Kindergarten Approach to Learning.” We will also share with the Scratch community the six stages ITJ is working on with Scratch.

Desert-Dwelling Australian Aboriginal Children Scratching Their Choice to Learn

Krystof Haber

Antarringinya students provide evidence that desert-dwelling Australian Aboriginal children with low literacy levels need, enjoy, and are capable of using Squeak-based programming languages to author software projects that express their creativity and knowledge. In this talk I’ll discuss the current educational situation of Indigenous Australians and the results of my study. I’ll also demonstrate methods of introducing Scratch to remote Indigenous students and share video showing the Indigenous students talking about their work with Scratch and demonstrating practical applications of Scratch as a tool promoting literacy, co-operative and innovative problem solving, and peer-teaching. Educational approaches to facilitate and stimulate creative thinking in Indigenous students will be discussed.

The Cube Trying Out (and Thinking About) Different Ways of Introducing Scratch

Jay Silver, Eric Rosenbaum

How do you introduce Scratch? This session will explore a variety of ways to help kids get started with Scratch and imagine the possibilities of Scratch. We’ll talk about using a little structure or a lot, making it personal, choosing great examples, and supporting a wide variety of interests. We will present several examples of different approaches, talk about the participants’ own experiences, and brainstorm some new ideas.

Concurrent Sessions, Thursday 1:30-2:30

Bartos Theatre **It Might Be Computer Science But It Isn't Fun!**

Ursula Wolz, Monisha Pulimood, Chris Dunne, Nikhil Pulimood

The title of this panel was stated in unison by the two adolescent panelists, Chris Dunne and Nikhil Pulimood, who stated it to their mothers, Ursula Wolz and Monisha Pulimood. They then discussed what kinds of projects they liked to do in Scratch. Their mothers teach computer science to undergraduates. The discussion was about what you can learn about mathematics, science, and computation from Scratch, and what kinds of projects are fun to make and fun to interact with. The discussion compelled the computer science professors to think more deeply about the way computer science is traditionally taught. The resulting insights are a complete rethinking not only of the kinds of problems posed in classes, but also of the need for more dramatic curricular changes, such as who defines projects, which skills are emphasized, how skill acquisition takes place, and how student work is evaluated.

Wiesner Room **Creating Change: Educational Ideas and Scratch**

Natalie Rusk, Karen Brennan

What do people learn when they create with Scratch? In this session, we will discuss core ideas about education that inspire and underlie Scratch—and how these ideas can transform the ways people think about learning, literacy, and creative expression.

de Rothschild Room **Learning to Choreograph Dances with the Scratch Beat Box**

Stefanie Mayer, Gottfried Mayer

For choreographing new dances we use different Scratch clones for different dance sequences, each of the clones doing one part with three moves. To share a whole dance we have instructions about the sequence of instruments to choose and which clone's part to do in which order. We had fun changing backgrounds so that we danced in different locations. We also explored the possibility of including our recorded sounds instead of the Beat Box instruments. Finally, we got a Scratch Board and experimented with using the board's sensors to interact with the Scratch program during the performance. In this presentation we describe how we modified the original Beat Box project as a tool to choreograph our own dances. We give demonstrations of the program and show how we used it to learn and share our dances.

Students as Teachers

Karen Randall

Students are eager to share their Scratch excitement by teaching others. Encouraging this peer coaching supports deeper thinking. Evolving from a workshop instructional model, fifth and sixth graders at Expo School in Minnesota developed the "Scratch Squad," teaching other classes as well as adults at a state technology conference.

How to Get Girls Involved in Game Programming Using Scratch

Bela-Andreas Barge

Looking for a way to motivate girls to program their own computer games? Women are still under-represented in many technical professions, including computer science and its sub-disciplines. While there has been a lot of progress in coeducation during the last century, we still face numerous challenges in equal opportunities. Unfortunately, many girls start losing interest in the natural sciences during school. Following the idea of "take our daughters and sons to work day" Germany established the "future day for girls" in 2001, named "Girls' Day." Fraunhofer Institute participated the last two years to familiarize girls with careers in technical fields. Besides workshops in computer vision and robotics, we also provided several sessions using Scratch, Squeak, and Alice. Our presentation and talk will cover experiences and ideas on how to stimulate intrinsic motivation of girls while programming a computer game for the first time.

Room 135 Scratch in the Elementary School

Lee Appelbaum

Share in the introduction of Scratch programming as a foundational cognitive tool for learning across the elementary school curriculum! For this age group, we focus more on programming as a tool to support the math, science, and foreign language curriculums than on teaching programming practices. We will present sample projects from the different grade levels and subject areas. Possibly due to the age of our students, Scratch has become mostly a successful instrument of classroom differentiation. As a result, assessment is a challenge as we rely on qualitative evaluations with small sample sizes to infer the effect of programming activities. However, the small population does allow us to perform in-depth assessments, including surveys, interviews, and videotapes, which we will share. We will also share the results of our parent survey, covering their level of support, participation, and belief in the effectiveness of programming in the early years.

Comparing Notes: Misconceptions in Scratch

Colleen Lewis

Research has shown misconceptions to be prevalent across programming languages. With any programming language there will be misconceptions that arise from the specifics of that environment. As educators, it is essential to anticipate and understand student misconceptions in the domain. I will examine two such misconceptions that I have found thwart students in building a mental model of Scratch execution. In my experience working with students from third through seventh grade, a large percentage of students believe that each line of code in a block executes concurrently, and that blocks of code do not produce predictable results. For each misconception I speculate about the cause and propose a method to avoid or build from the misconception.

Scratch vs. MicroWorlds

Mark Werness

Since 1991, I have taught a "Computers in Elementary Education" course using the latest version of Logo (currently MicroWorlds EX Robotics) as an important element in the course. MicroWorlds has been used in many roles: as a tool to explore computer programming concepts, as a programming language used to create small educational software examples in drill and practice, simulation, and animation, as an environment to explore discovery learning in math and geometry, as a tool to create hypermedia/multimedia demonstrations and lessons, and as a way to explore sound and music. Last spring, I began using Scratch in this course while continuing to use MicroWorlds. The question arises as to which of these tools might be better for certain topics or exercises and projects. I will discuss my experiences with the use of MicroWorlds and Scratch in my "Computers in Elementary Education" course in the roles described above.

The Cube Embedding Scratch into the School Curriculum

Bharat Shah

This workshop involves discussing the thinking skills necessary to create a Scratch project and mapping these skills onto a school curriculum with the aim of identifying ways in which to embed Scratch into an existing school curriculum. Schools are already required to teach the same generic thinking skills that are used in making Scratch projects. So, by identifying these thinking skills, Scratch can be used as a valid medium for developing these skills in cross-curricular areas of the curriculum. In this workshop we will collaborate to identify these thinking skills and locate their relevant references in your school's curriculum. The outcome of this workshop is for participants to embed Scratch into a range of subject areas in the school curriculum. Examples of thinking skills and references to the National Curriculum for England will be provided based on action research from three case studies in England.

Concurrent Sessions, Thursday 3:00-4:00

Bartos Theatre **Designing Scratch: Past, Present, Future**

John Maloney, Natalie Rusk, Brian Silverman

How did Scratch come to be the way it is? What are its underlying design principles? Why does Scratch have some features and not others? What's next? This session, led by three members of the original Scratch design team, will explore these questions. We will look back at the roots of Scratch, including MicroWorlds Logo, LogoBlocks and Squeak Etoys. We will also discuss visions for the future of Scratch.

Wiesner Room **Scratch Solutions for Urban Schools**

Dan Cogan-Drew, Annjanette Bennar, Venice Sterling, Quenton Narcisse, Hector Guzman
Our panel will share two stories of "successful Scratching" by Connecticut students. One urban high school used Scratch in a state-wide computer game design competition to teach math to middle school students. Stranded on an island when their plane crashes, players of "From X to Y" must learn the mathematical concept of coordinate planes by solving equations to find X and Y values. Each move to a correct point on a coordinate graph helps the player collect and assemble parts to a boat that they will use to sail home. In another urban high school, two students from this same design competition were inspired to construct and pilot an online after-school curriculum in Moodle for middle school students to learn programming using Scratch. Panelists include a teacher and three students from the two high schools and a program developer from the agency conducting the design competition.

de Rothschild Room **COMPUGIRLS' Experience with Scratch**

Kimberly Scott

If computer science courses are offered in high-needs contexts (and this tends not to be the case), they are often culturally irrelevant, do not consider girls' preferences for collaborative work, and are uninteresting. Arizona State University's COMPUGIRLS addresses these concerns by offering adolescent (grades 8-12) girls from Phoenix's under-resourced schools a series of culturally relevant computer science and media classes. Each course implements a curriculum undergirded by social justice themes. Two Scratch participants will discuss their projects and how their involvement made an impact on their self-efficacy, logical thinking, and organizational capacity for narration, aesthetics, and presenting a socially relevant issue in a multimedia language. We anticipate that our presentation will provide useful feedback and inspire a discussion of strategies to improve Scratch as a tool that will foster the technical skills of all students.

Room 135 **Scratch as Groupware**

Timo Goettel

Why do we need to reflect on Scratch as a tool that is offering computer supported cooperation (CSC)? Scratch is a great programming tool for kids. It enables everyone to create appealing games or other contents. In two case studies in Hamburg, Germany using Scratch it became apparent that reasonable CSC is a very important aspect of game design with pupils. Unfortunately, it seems slightly neglected by Scratch. In my talk I will report on reappearing CSC problems during the use of Scratch in our case studies: the participating pupils often faced difficulties in designing one corporate game that is developed in distributed teams. This talk is meant to be a first step in extending Scratch to offer sound CSC in near future. Ideally, this would lead to a kind of special interest group on CSC aspects of Scratch and a development team.

λ - Scratch

Katherine Gunion

It has been argued that even very young students are able to appreciate naturally recursive models. Tasks like the towers of Hanoi and "elephant spin out" are great examples of problems with recursive solutions that children are often able to embrace effortlessly. Yet, ironically, we are seeing our students struggle with this concept in our first-year programming courses when it is introduced in the context of an imperative language. Are we doing too little too late? We believe that developing and recognizing a correct implementation of a recursive solution is a mental workout that requires training to master. In response to this we are developing a series of "unplugged" activities targeting these issues, coupled with corresponding programming exercises. In this session we explore rudimentary examples currently implemented using Scratch's send and receive blocks, and also discuss the tradeoffs of extending Scratch to further facilitate these kinds of programming adventures.

Scratch as a Game Design Teaching Tool: Benefits and Limitations

Stephen Howell

We teach Scratch as part of a game design summer school to high school students. This has led to a number of observations on how older students (ages 15-16) can learn and use Scratch with minimal training. We include aspects of how Scratch is taught using problem-based learning and the types of games designed and developed by the students. An exploration of game design limitations commonly faced using Scratch is included. A number of potential technical features are presented to address these limitations, namely textual input and output, spawning of existing sprites without the need for individual corresponding sprite asset, and a simple file-backed data structure to allow 2-D array implementation.

Room 235 Digital Fluency and Its Importance in Educating Young Students for the Knowledge Age

Razvan Bologna

This presentation describes the experimental results obtained while testing Scratch on a group of 18-year-old students who volunteered to be part of the study. The experiment was performed in an attempt to find arguments to persuade local Romanian educational officials to insert the study of Scratch as an optional subject in public schools. In the study, Scratch has been used mostly to assess the level of digital fluency of students. At the end of the experiment, authors found statistical evidence that indicated a correlation between the level of digital fluency of the students involved in the experiment and their ability to use standard computer applications necessary to everyday life. The conclusions can be useful for all of those involved in building young minds for the knowledge age.

Computational Concepts for Transition Year Students Using Scratch

Clare McInerney

Lero, the Irish Software Engineering Research Centre, was established in November 2005 with the support of Science Foundation Ireland's (SFI) CSET (Centre for Science, Engineering and Technology) programme. The establishment of CSET Education and Outreach Programmes is a SFI requirement. These programmes aim to convince students that science, engineering, and technology offer good career opportunities. The technology curriculum at second-level in Ireland does not give students insights into a typical first-year undergraduate computer science degree programme. According to Ireland's Technology News Service, 98% of Irish schools now have broadband access; practically all schools are networked, but computer facilities and staff expertise varies considerably across schools. We started teaching computational concepts to Transition Year students using Scratch in October 2007. This session covers our experiences with teachers and students and our plans to introduce Scratch into the curriculum.

Mental Models, Programming Aptitude, and Scratch

Tina Götschi

Understanding how students learn to program is difficult and teaching programming is not always successful. My research, based on my experience teaching a first programming course using Scratch to 14-year-old girls addressed the questions such as is it possible to determine whether someone will be a successful programmer and is it possible to teach everyone to program? Before the students started the course, I gave them a test which I developed to determine whether they will be successful programmers. After the course I examined the results of the test and the students' programming results to see if my test was an indicator of success. I will also consider the mental models of programming that the students constructed and discuss how my teaching was guided by understanding students' mental models, especially those that were non-viable and thus needed to be challenged if the student was to become a successful programmer.

The Cube 2 minutes and 10 seconds

Keith Braafladt

We've been looking at ways to respond to the challenges of working with teens in drop-in programs for local community libraries. How do we attract and engage teens? How do we interest them in developing projects that are relevant to their own experience when we have their attention for as little as five minutes? To grapple with these conditions we've begun developing an approach that encourages youth to use the music of their life as catalyst for personal expression. For the workshop we'll look at some Scratch projects that use a pop/rap/hip hop song as foundation for expression and as a rigid structure to work with and around. We'll then create our own Scratch songs to share with others.

Concurrent Sessions, Friday 9:30-10:30

Bartos Theatre **The Evolution of the Scratch Website and Community**

Andrés Monroy-Hernández, Karen Brennan, Jens Moenig, Mark Goff

By sharing stories and statistics, we will provide a picture of how people have participated in the Scratch online community over the past year. We will present some of the innovations, surprises, and challenges we have encountered as moderators of the community, and discuss future directions for the Scratch website and community. The session will include opportunities for you to share your ideas and suggestions.

Wiesner Room **Library as Possibility Space: A Constructionist Framework**

Jennifer Nelson, Keith Braafladt, Brian Myers

Our program is designed to highlight the ways libraries have begun to recognize their role in constructionist informal learning using Scratch. Working over the last two years we've had much success and any number of challenges in adopting Scratch as a library program. We'll talk about the challenges as well our conviction that 'if not now, never,' is how public libraries need to approach innovative technology programming using our highly skilled community partners. In Hennepin County we've been particularly interested in identifying how using Scratch contributes to building 21st century literacy skills for youth. We recently completed a small-scale research project on the topic. Brian Myers uses Scratch as an effective way to teach youth game development and has successfully conducted classes in the library with an engaged set of youth. But mostly we'd like to help you understand how libraries can be your partner in Scratch programming.

de Rothschild Room **African Folk Tales Retold**

Barb Tennyson

Fifth graders wrote individual folk tales and then animated them using Scratch. These animated versions were designed for and dedicated to their preschool reading partners. A sharing session was then held so that the older students could see their younger partners interact with their Scratch creations. Fifth graders became so invested in their work that they asked to come in before school, after school, and even during recess! Samples of the students work will be shown and discussed.

Synergistic Effects of Enacting, Visualizing, and Manipulating Codes in Scratch to Promote Understanding of Programming and Mathematical Concepts

Margaret Chan, John Black, Cameron Fadjo, MingTsan Pierre Lu, Jiwon Shin

The presentation will report on how Scratch is used as an interactive medium to help elementary school students (3rd to 7th graders) understand computational and mathematical concepts while learning to design and create animated games in an after-school video game production class. Programming skills are regarded as a core component of computer literacy and fluency. While conditionals and looping are the core programming concepts we focused on, students are also expected to master pertinent mathematical concepts, such as variables and random numbers. Mitchel Resnick has remarked that, too often, programming instruction is not grounded in learners' experience, which compounds the difficulties for beginners to understand the abstract symbols and their formal operations. Embodied cognition researchers have argued that cognition arises from bodily interactions with the world. Therefore, we hypothesized that seeing and performing the physical movements of the programming codes in Scratch in a real-time environment may aid learners.

Storytelling with Scratch

Jill Pears

This presentation focuses on my experiences using Scratch for storytelling, and demonstrates how to keep the balance between computer programming and storytelling so that students produce a quality digital storytelling experience while developing a variety of computer programming concepts. It includes examples of stories and details practical teaching methods and strategies to encourage problem solving so that projects quickly move from the simple to the complex. Reflection and self-assessment are an important part of the teaching process. A rubric, which supports both programming and storytelling, developed in conjunction with students, is introduced.

Room 135 It's Elementary: Scratch

JoNelle Gardner, Audrey Cageao, Patty Granger

This session will focus on introducing Scratch to fourth and fifth grade students. We will show how we taught the basics to our students using the Scratch videos, cards, reference guide, and teacher-made tools we created. We will share some of our students' work, their reactions to Scratch, and how we integrated standards for our classroom and computer lab. We will tell about our experiences and the challenges we encountered. We will also share correlations to standards in math, science, language arts, and ISTE NETS. Time will be available for questions and discussions.

A Website to Disseminate Scratch Using Video Tutorials: LearnScratch.org

Juan Carlos Olabe, Christine Rouèche

This presentation reviews the main steps in the creation and deployment of a website created for the dissemination of Scratch using several sets of video tutorials. The objectives, software and hardware required, and the obtained results are described. A final section lists the objectives set for the second version of the website to be published in the fall of 2008. Topics to be discussed include the methodology for the recording of the video tutorials, the pedagogical techniques used to incrementally introduce the features of Scratch, and the structure of the website and the open-source software used for its implementation. Also to be discussed is an overview of the utilization of the site since its publication in the summer of 2007, and how some schools are using this material in their curriculum. New areas of development in this project will be covered as well.

Scratch in Russia

Yevgeny Patarakin

The development of Scratch in Russia is closely linked to the development of the Letopisi community. Currently based on www.letopisi.ru, it collects numerous articles illustrated with course materials and examples of projects in Scratch. In 2008 in Russia, Intel supported a competition for young programmers to create Scratch projects. Screencasts supporting education and the use of Scratch language are available online.

The Cube Scratch Cards for Scratch Boards

Marty Billingsley

Have you explored the Scratch Cards, those printable documents that provide mini-tutorials on various aspects of Scratch? They're colorful, concise, and really useful in learning about the Scratch environment. Have you tried out a Scratch Board? It's a circuit board with a USB interface that lets people interact with Scratch programs through a slider, touch button, light sensor, microphone, and set of resistance sensors. They add a whole new dimension to Scratch programming! In this workshop we'll brainstorm lots of ways to use Scratch Boards, in particular how to use the resistance sensors with everyday materials. Then we'll take these ideas and create a Scratch Card for each, ending up with a series of mini-tutorials that will help everyone to use the Scratch Boards in fun and interesting ways.

Concurrent Sessions, Friday 11:00-12:00

Bartos Theatre **Social Creativity and Meta-Design: Exploiting the Long-Tail for Design, Learning, and Collaboration**

Gerhard Fischer

Our research is exploiting the “long tail of distributed knowledge” by grounding design, learning, and collaboration of all stakeholders in interest and passion, self-directed learning, intrinsic motivation, and personally meaningful problems. These objectives are supported by meta-design (focused on “design for designers”) and social creativity (focused on “transcending the individual human mind”) by making all voices heard in the framing and solving of complex design problems. The presentation will discuss conceptual frameworks for empowering individuals and communities engaged in collaborative design activities; present lessons learned and challenges ahead derived from our research over the last few years in a number of different specific application areas: and explore the mutual impact and relationship of our frameworks and applications to address the core challenge and opportunity of the Scratch community to empower and support “students’ shift from media consumers to media producers, creating their own interactive stories, games, and animations—then sharing their creations on the Web.”

Wiesner Room **Scratch in the Interactive Journalism Institute for Middle School Students**

Ursula Wolz, Kim Pearson, Mary Switzer, Monisha Pulimood, Meredith Stone

The panelists are all participants in a National Science Foundation “Broadening Participation in Computing” project. Our premise is that underrepresented groups opt out of career paths as early as middle school and that to keep these constituencies in the pipeline requires presenting computation within a novel and socially relevant framework. As a group we recognized the synergy between computational skills and journalism skills. Both require principled creativity and disciplined design perspectives. Traditional computer science tends to scare off good writers and artistic designers because of the perception that programmers are “code monkeys.” Our project provides middle school students with an introduction to computational skills and concepts while they engage in the creative process of building an online interactive magazine. This panel will present the outcomes of our two-week summer experience with the students, their teachers, and our undergraduate research assistants from five perspectives.

de Rothschild Room **Various Ways to Bridge Real and Virtual Worlds**

Kazuhiro Abe

Experiments in both real and virtual worlds are important when we hold a workshop for children. The real world has physical limitations: for example, the “TURN 90” command does not mean 90 degrees for a robot, as the robot sometimes turns more or less than 90 degrees. This never happens in virtual worlds such as Logo, because the virtual world does not have physical limitations. Children should learn these differences. LEGO Mindstorms and Cricket are leaning toward the real world. In contrast, Logo, Squeak Etoys, and Scratch are leaning toward the virtual world. I will introduce a small device called “World-Stethoscope.” It extends Etoys toward the real world. World-Stethoscope has an input port that can measure voltage (0 to 3V). Various sensors (luminance, temperature, distance) can connect to it and it has an output port for sound. The Scratch Board made by the MIT Media Lab is similar to World-Stethoscope in many points.

Starting from Scratch: Early Experiences from the Lajedos Site Museum

Roger Meintjes

The Lajedos Site Museum, located on the island of Santo Antão, is a work-in-progress project of NGO Atelier Mar. It aims to investigate how the museum structure can function as a vehicle for rural development. Through one of its components, a learning technology and toy making facility, the museum plans to reinvigorate and extend Cape Verde’s rich toy-making tradition and encourage technological fluency amongst young people in the region. This approach will hopefully introduce computing to the community in a form continuous with people’s lives. A Scratch Boards workshop in June 2007 marked the first step of this process. This presentation will focus on issues arising from the experience, including: the complexity of building alternative relationships with computers, particularly ones that harness local craft knowledge; the potential of constructionist community resources in rural developing contexts; and sustainable networks for sharing Scratch across dispersed rural communities.

GamePad

Keith Braafladt

Scratch seems to live in three domains: on the desktop, on the Scratch website, and the Scratch Sensor Board. GamePad is a class that the Learning Technologies Center has been running for youth since the Sensor Board became available. In GamePad, the participants develop an interactive game in Scratch—an introduction to computer science—and then explore electrical engineering through construction of circuits and sensors. I'll talk about our experiences connecting Scratch to the real world through the Sensor Board, and how using the Sensor Board has helped us develop new program approaches to connecting the screen world with the physical world and provided new ways to explore personal narrative and basic circuits and sensors.

Room 135 The Pedagogy of Children's Digital Art

Phoebe Hui

This presentation shares my experience facilitating the use of Scratch as an artistic medium in the visual arts curriculum. I will discuss examples of my students' projects using Scratch and Scratch Board, in particular their visual-audio exploration of the light sensor based on Johannes Itten's ideas about chiaroscuro and color, and their experiments with the image-sound relationship. Combining a Bauhaus ideal of art education with a constructivist emphasis on active learning, I develop a way of teaching and making art that exploits the unique possibilities of computational media.

Pitfalls of Scratch in an EFL Setting in Taiwan

Ruth Martin

Sophomore university students in Taiwan were each asked to create a 30-second Scratch video to supplement a teaching unit on carbon footprints. Surprisingly, the Scratch video turned out to be one of the least favorite and most difficult activities. Follow-up interviews indicated that both culture and learning strategies influenced results. Many Chinese students are more comfortable working in groups, and several students felt it would have been more successful if they had worked with others. What the instructor perceived as freedom and space to be creative, students felt was a lack of direction that did not provide specific guidelines. Many students used the sample Scratch videos and just varied each of the parameters; only a few actually tried to learn the program by trying out every option. Future projects of this type should include more direct teaching and a breakdown and practice of each Scratch feature.

Situating the New Media Literacies Skills in Scratch

Andres Lombana

This presentation combines the topics of pedagogy and technology in order to provide concrete examples of how the New Media Literacies skills are practiced by the Scratch community. The New Media Literacies (NML) Project at MIT's Comparative Media Studies program explores digital literacy, guided by two questions: What do young people need to know in order to become full, active, creative, critical, and ethically responsible participants in a media-rich and globally-networked environment? and, What steps do we need to take to make sure that these skills are available to all? In response to these questions, the project's Learning Library features activities that teach NML skills by offering designed experiences for using readily available technologies and applications. I describe three activities that use Scratch as a tool for learning NML skills in the context of the Scratch community.

Room 235 Harnessing the Power of Scratch to Teach Math Concepts

Colin Meltzer

How does one harness the teaching power of Scratch in and out of the classroom? This presentation will focus on how to use Scratch as a tool to teach fundamental mathematical and learning skills in a fun, innovative way. I will cover the following three topics: what skills students can learn from using Scratch, my experiences using Scratch with students as a middle school mathematics teacher, and the key components of a successful Scratch learning experience.

Scratching the Maths Itch

Jane Harris

We will look at where mathematics teaching is currently heading through a brief review of curricula, and then consider this in the context of the current educational paradigm of instructional pedagogy and fragmented learning. The question we introduce is: How do we move towards androgogy and contextual learning? The presentation will outline how Scratch can be used as an authentic platform for double-loop professional development, as well as replacing some of the more traditional strands of maths with authentic, knowledge-sharing opportunities. We will construct a voice thread so participants can access and comment on the content ahead of time. Creating the voice thread will provide us with a "live" document which will be the starting point for the presentation.

Scratch: Patching the Digital Divide

Jennifer Wardell, Emilie Reiser

Working deep in the inner city of New York to patch the digital divide, Vision Education & Media provides after-school programming in multiple technologies. Scratch has a fast adoption rate in low-income schools, as licensing costs are no longer a barrier to implementation. We will present a handful of case studies of successful grant-based programs using Scratch in schools in under-served areas. The presentation will highlight a new learning model as well as showcase various original student projects.

The Cube ScratchEd

Karen Brennan

This session will introduce ScratchEd, a new website where educators can share experiences and learn new ideas about Scratch. ScratchEd aims to support ongoing professional development and capacity building among Scratch educators. The website will provide educators with access to curricular materials, opportunities to share their own stories and materials, and ways to coordinate in-person meetings with one another. During the session, we will explore the website and collectively imagine the possibilities for ScratchEd participation.

Concurrent Sessions, Friday 1:30-2:30

Bartos Theatre **Sharing Issues: Intellectual Property and Scratch**

Dan Pote, Wendy Seltzer, Judith Donath, Andrés Monroy-Hernández

In this panel, we will explore ways of imbuing children in the Scratch community with the spirit of the Creative Commons license under which Scratch is offered. Notwithstanding the clear attribution scheme used for “remixed” projects, and the fact that the phrase “imagine, program, share” appears on nearly every page, the forums and comments sections continue to be populated by user complaints about “plagiarism” and the like. The question then becomes: How do you teach young Scratchers about these things, particularly given the global reach of Scratch and the manner in which the philosophical underpinnings of intellectual property vary from country to country?

Wiesner Room **What Exactly Are Kids Learning in Scratch? Observations from the Clubhouse**

Kylie Peppler, Yasmin Kafai

In this session, we share research findings from over four years of ethnographic work at two Computer Clubhouses in Los Angeles, which were some of the earliest adopters of Scratch. In these settings, we tracked longitudinal data, collected interviews with Clubhouse participants, and captured observations of participants engaged in Scratch. We share research findings that point to ways of supporting a local Scratch culture and the learning that takes place while youth engage in making projects in Scratch. Our work demonstrated that when youth create work in Scratch, they learn key concepts in computer programming, new media, and the arts. Implications of this work will be explored for classroom teachers wanting to connect to core subject area content and for others wanting to learn more about how to document learning in their settings.

de Rothschild Room **Scratching is Elementary, My Dear**

Sharon Neff

It is quiet when you walk into Mrs. Neff’s classroom, but you can feel the power and energy of 23 brains working, in focused, concentrated beams of energy on their computer screens. It is the holiday season, a time when discipline problems are at their peak, but when you come into the lab there is only the sound of brain activity. This presentation will share: the challenges and triumphs of teaching Scratch to upper-elementary, mixed-ability children; what approaches facilitated student learning and creativity; how to integrate curriculum into Scratch teacher and student created work; what content can be integrated into Scratch activities; how Scratch fits into the ISTE NETS standards; what elementary students have to say about Scratch and why it is important; how our most challenged students benefit from Scratch.

Disabilities and Scratch

Rafael Sánchez-Montoya, Carmen López-Escribano

People with disabilities meet barriers of all types. By using computing technology, students with disabilities are capable of handling a wider range of activities independently. Still, students with visual and motor disabilities face a variety of barriers to Scratch use that restrict them from enjoying the experiences provided by this program. Although these barriers can be grouped into different categories, the most important is that the Scratch interface is not designed according to Universal Design principles: equitable use, flexibility in use, simple and intuitive, perceptible information, tolerance for errors, low physical effort, and size and space for approach and use. Hardware and software tools (known as Assistive Technology) have been developed to provide functional alternatives to standard computer operations. To assist students with visual and motor disabilities in using Scratch, we have used specific products and approaches as a bridge between the students and Scratch.

Empowering Students Through Powerful Contexts: Adaptive Technology

Karen Randall

Expo Elementary students researched the needs of a class of kindergarteners who have disabilities, and then created Scratch projects and switches tailored to students’ individual needs. Their process of research, design, testing, and debugging demonstrates how students can use Scratch in real-world problem solving.

Room 135 Using Scratch to Learn with Technology

Jeff Boyer

Learning with technology is often more motivating, more enriching and more effective than learning from technology. During this presentation, we'll explore how Scratch can be used to learn with technology for youth and prospective teachers in a technology summer camp and an undergraduate technology integration course.

A Case Study: Integrating Scratch in the Curriculum of the Public and Private School Systems in Memphis, Tennessee

Juan Carlos Olabe, Christine Rouèche

This presentation reviews the strategy, main tasks and current results in the process of integrating the use of Scratch in the public and private school systems of Memphis. The presentation is organized in four sections which describe the general approach designed for this integration as well as the main specific tasks being implemented in the process. Finally, a future direction section describes the set of activities being planned for the second phase of the process. These initiatives are managed at Christian Brothers University, a private university in Memphis, in collaboration with public and private school and institutions, and with external funding from local foundations.

Scratch Me!

André Williams, Alec Julias

Culture, technology and communication are recombined for educational purposes. Great resonance exists between self-education and creative exploration as motivation for new forms of learning through use of popular culture memes and codified expressions. Scratch allows the student to create new maps to navigate uncharted territory in learning that are useful to the individual and the community at large. I propose to discuss new modes of instruction aimed at leveraging technology and culture to produce educational "styles" that are flexible for every student's level. These new modes require discovery through practice rather than a linear and monolithic approach that considers "one size fits all." Crucial to this model's success is the process of reverse engineering ideas back towards their "source." There are many cultural equivalents to this practice. I intend to demonstrate a few of them during my presentation.

Room 235 Scratch in Computer Science 1

Inés Kereki

We used Scratch in two Computer Science 1 (CS1) courses at ORT Uruguay University: one in university degree and the other in vocational studies. We applied it during the first three of our 15 weeks in those courses. The purposes were to improve students' programming experiences and motivation and to detect its influence in scores and dropout rates in comparison with standard courses. We developed our particular set of exercises, lab guides, and tests. Our research results showed that students who used Scratch expressed higher motivation, but we did not find statistically significant evidence of differences in dropout rates or in obtained scores. We present the detailed courses, the experimentation and the results. Also, we will offer some reflections on the use of this kind of tool in CS1 courses and suggestions to improve Scratch.

Getting the Itch with Scratch

Jeff Parker

Scratch makes it easy to program, and instructors are starting to use Scratch as a gateway experience in introductory programming courses. What do we need to keep in mind when making the transition between Scratch and programming languages? Scratch provides an inviting way to present programming concepts to students without prior programming experience. Students can write applications that use decisions and repetition within an hour. Concepts that seem natural in Scratch are harder to duplicate in procedural languages. While it is easy to write a loop to move an image in 10 steps, a loop in a procedural language needs a loop condition, usually implemented with a loop variable that needs to be initialized and incremented. In this session, we discuss some of the hurdles students face in making the transition from Scratch to general languages, and suggest some areas that the instructor needs to clarify.

HCI Alternatives Using the Nintendo Wii

Leanne Ross

We present a project that is set up for a first-year university course. Students design and implement in Scratch a software prototype of a wrist rehabilitation tool that utilizes the Wiimote (Nintendo's remote control for the Wii console). Students draw upon their own creativity and problem-solving skills to satisfy both rehabilitation and entertainment objectives. In addition, practical knowledge of software engineering, object-oriented programming, and human-computer interaction (HCI) is used to translate physical gestures into game actions using the Wiimote. The functionality of the Wiimote must be analyzed and an efficient mapping of controls to produce maximal rehabilitation of wrist actions will be expected. Many aspects of wrist rehabilitation (pronation, supination, flexion, and extension) can be accomplished with the Wiimote. This project, although meant for first-year computer science students, can be modified to fit higher-level computer science projects as well.

The Cube Creative Collaboration with Scratch: A Media Art Performance Approach

Seung Joon Choi

The purpose of the workshop is to show how people get motivated and form a learning context when they participate in a collaborative performance. Every Scratch-enabled laptop can be a VJing console. Participants are encouraged to make vivid visuals that can be sources for remixing by the video mixer that the VJ uses. Some of them can also take roles as DJs by using sounds under Creative Commons licenses. Themes of the performances will be given and participants can take their roles by themselves and then create or remix their visuals and sounds for 30 to 40 minutes. When they are in the groove, their attempts to make cool images will help to overcome the hard parts like learning mathematics, and collaborative environments help transmit ideas easily from person to person. At the end of the workshop we will perform a short live audio-visual performance. Scratch rocks!

Biographies

Kazuhiro Abe is a Smalltalk programmer who has participated in many Smalltalk projects that include 3-D Graphics Library, CASE tool, Japanese localization, CRM system, Foreign Exchange Dealing system, and Semiconductor CMP system. He has worked for children's education with Squeak Etoys since 2002 and conducts many workshops in Japan.

Lee Appelbaum provides the technology support at Ormondale Elementary School. He trains teachers and students on hardware and software, often developing and leading instruction. In the last year, he has introduced students to computer programming to support class work and to develop games during free time.

Bela-Andreas Bargel studied educational and computer science at Otto-von-Guericke-University in Magdeburg, Germany. The combination of two majors allowed investigation of the zeitgeist of education and formation in terms of cyber-culture, life on the screen, and community building, while combining questions of computer science and graphics from different perspectives.

Annjanette Bennar is a computer teacher and technology curriculum leader at Pathways to Technology Magnet School in Hartford, Connecticut. She is a lead teacher and five-year participant in the IT program. This year she taught and advised Venice Sterling, Quenton Narcisse, and the Pathways "TekRush" team.

Marty Billingsley has been teaching computer science at the University of Chicago Laboratory Schools for 13 years and feels lucky to be part of a school where computer science is valued for the creative thinking skills it instills in children. She has developed curricula for middle and high school students that utilize a variety of programming languages, and is delighted to have Scratch in her arsenal of teaching tools.

John Black is the Cleveland Dodge Professor in Telecommunication and Education, and the chair of the Department of Human Development, Teachers College, Columbia University. He is also the director of the Institute for Learning Technologies at Teachers College.

Jeanene Bluhm de Carvajal received a BS in Education from Valparaiso University, and an MS in Education from the University of Massachusetts. She is founder and general director of Instituto Thomas Jefferson, and a member of the first advisory board to the El Reforma Newspaper Public Speaker for educational forums throughout Mexico.

Razvan Bologa is affiliated with the computer science department of ASE Bucharest, Romania. His research interests include knowledge management and information systems. He has a PhD in the social impact of high-tech and applies his research results in the business environment by offering consulting to multinationals that outsource software development in Eastern Europe.

Jeff Boyer is a visiting lecturer in the educational technology program at the University of Florida's College of Education where he teaches courses on technology integration for pre-service teachers, hosts the Digital Kids Tech Camp for rising third through sixth graders, and is a doctoral student researching youth-created media.

Keith Braafladt is senior manager for research and development at the Learning Technologies Center at Minnesota's Science Museum. His experience ranges from teaching game design and using art in technology to developing innovative technology programs with cutting edge tools with community partners to mentoring youth in STEM activities.

Karen Brennan is a graduate student in MIT Media Lab's Lifelong Kindergarten research group. She holds a BSc and BEd in computer science and mathematics, and an MA in curriculum studies. In her research, she is currently exploring the use of technology to support communities of educators.

Audrey Cageao is currently a technology teacher in an elementary school. She has 10 years of teaching experience, including teaching talented and gifted, kindergarten, and third grade. She recently received her master's in technology in education from Lesley University. Teaching technology to younger students is the best job she can imagine.

Margaret Chan is the assistant director of research at the Institute for Learning Technologies, Teachers College, Columbia University. Her research interests revolve around cognition, learning, and interactive technologies, with a special focus on the application of neuro-science in cognitive research. She works with students from grades 1-12 and adults attending college.

Seung Joon Choi is a media artist who believes that the potential of media arts will inspire various education levels. To get into the action, he learns and collaborates with various artists. He also makes scientific subjects including computer science storytelling. Through this process, he would like to make a connection with people and share creativity and culture.

Dan Cogan-Drew is a senior online development specialist at the Center for 21st Century Skills @ EDUCATION CONNECTION in Litchfield, Connecticut. Dan co-coordinates the IT curriculum in the Connecticut Innovation Academy program, a grant-funded initiative to encourage high school students to pursue careers in science, technology, engineering, and mathematics.

Judith Donath directs the Sociable Media research group at the MIT Media Lab. Her work focuses on the social side of computing, synthesizing knowledge from fields such as graphic design, urban studies and cognitive science to build innovative interfaces for online communities and virtual identities.

Chris Dunne spent two months deeply involved in Scratch programming before entering high school this fall. He created two dozen projects ranging from games to music players to interactive stories to parodies of TV shows. He also used Scratch to fulfill a history assignment.

Evelyn Eastmond has been a developer for Scratch for a few years, and she continues to learn and grow as Scratch itself evolves. She is extremely excited to be a part of this conference, and cannot wait to learn from Scratch enthusiasts from all corners of the world.

Gerhard Fischer is a professor of computer science, a fellow of the Institute of Cognitive Science, and the director of the Center for Lifelong Learning and Design at the University of Colorado at Boulder. His research is focused on new conceptual frameworks and new media for learning, working, and collaboration.

JoNelle Gardner has taught for 25 years and is currently an elementary technology teacher/trainer/instructor. She received her National Board Certified Teacher certification and recently received her master's in technology in education from Lesley University.

Stephanie Gayle is the administrator for the Lifelong Kindergarten research group at the MIT Media Lab. When she is not involved in all things Scratch, she writes novels and short stories. Her first book, *My Summer of Southern Discomfort*, was published last year.

Timo Goettel received his diploma in 2006 in media systems at the Bauhaus University Weimar, Germany. Since October 2006 he has worked as a research assistant at the University of Hamburg, Germany, Department of Informatics. He is now working on participative intercultural game design.

Tina Götschi began teaching in South Africa while obtaining a master's degree in computer science. How students learn to program and teaching programming has always been of interest to her and was the topic of her dissertation. She has taught programming with Turbo Pascal, Java, and JavaScript. She now lives and teaches in London and is teaching her first Scratch course.

Patty Granger teaches elementary level mathematics and science. Her students are 4th and 5th graders who qualified as being gifted by the state of South Carolina. She has been teaching in public schools for 14 years in a variety of areas. Mathematics and science have become her favorite subjects.

Katherine Gunion recently graduated from the Cognitive Systems Program at the University of British Columbia and is starting graduate school at the University of Victoria. She has been active in both the development and delivery of outreach material for elementary and high school students, and most recently has been involved in several Aboriginal initiatives with communities on Vancouver Island.

Hector Guzman is a junior at Crosby High School in Waterbury, Connecticut. He and his classmates founded Pheonicis Technologies, using Scratch to launch the game "Kozmo the Caveman" (see <http://ctxpo.org/projects/WATERBURYCHS/>). Alongside another Crosby junior, he has also co-developed a "Scratch After School" program for middle school students.

Krystof Haber has taught Indigenous students in various educational settings for the past 11 years, including eight years at Antarringinya Homeland Centre. He completed a graduate diploma in teaching and information technology and continues to study towards a master's in IT.

Jane Harris has an MSc in educational information and communications technology from the University of Edinburgh. She has worked as a classroom teacher and ICT facilitator in various countries around the world and is currently based in Hong Kong. Jane is excited by the changes ICTs are bringing to the educational paradigm.

Tracy Kwei-Liang Ho received her doctoral degree at Teachers College, Columbia University and is currently a full professor in the music department at Taipei Municipal University of Education, Taiwan. She was the founder and project leader of the Humanities and Arts Learning website (<http://arts.edu.tw>) sponsored by the Taiwan Ministry of Education from 2001 to 2006.

Stephen Howell is a computer science lecturer with the Institute of Technology Tallaght, Ireland. He is a computing graduate of Dublin City University and has developed software for a number of companies including Sapient and IBM. He is currently researching educational computer games in University College Dublin.

Phoebe Hui is a Hong Kong-born artist. She earned her MFA at London's Central Saint Martins College of Art and Design. She is currently head of the visual arts subject panel at the Logos Academy and part-time lecturer in the Hong Kong Academy for Performing Arts.

Alec Julias is a sophomore at Kealakehe High School on Hawaii. He has interests in programming and CGI, and is proficient in computing. He has been a Scratch user for four months and has excelled at making cool games. His user name is MasterOfMac.

Yasmin Kafai was born in Germany, and received her doctorate from Harvard University in 1993 while working with Seymour Papert and Idit Harel at the MIT Media Laboratory. She was also one of the co-PIs on the original grant from the National Science Foundation that funded the development of Scratch.

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Stefanie Mayer is a third-grade student at the Taipei American School who loves to dance and has taken classes in ballet, tap, hip hop, and jazz dance. She also likes swimming and gymnastics. Her parents work at the university and she has been participating in a science show with her father every other Saturday.

Clare McInerney is the Education and Outreach Manager at Lero, the Irish Software Engineering Research Centre. Lero is a collaboration of four universities: the University of Limerick, Trinity College Dublin, University College Dublin, and Dublin City University. Clare is responsible for raising awareness of software engineering and computer science in the Irish education sector.

Roger Meintjes was born in Cape Town. During apartheid, he worked with the politically aligned photographic collective Afrapix. Following South Africa's transition to democracy, he led exhibition development at the newly established Robben Island Museum. He is currently developing a rural community museum in Cape Verde and studying computing.

Colin Meltzer graduated from Middlebury College with a major in computer science and a minor in teacher education. After teaching the fourth grade in Vermont, he worked at Tom Snyder Productions, a branch of Scholastic, which creates educational software. Currently, Colin teaches middle school mathematics.

Amon Millner is a doctoral candidate at MIT. He develops tools, activities, and spaces for youth to create physical interactions with computer objects. He leads the efforts to connect Scratch and the physical world and helped design the Scratch Sensor Board. He holds degrees from Georgia Institute of Technology and the University of Southern California.

Andrés Monroy-Hernández is a PhD student at the MIT Media Lab researching web technologies for creative collaboration. Andrés led the development of the Scratch online community. He received an MS in media technology from MIT and a BS in engineering from Tec de Monterrey in Mexico.

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Geetha Narayanan is the principal investigator of Project Vision and the founding director of Srishti School of Art Design and Technology in Bangalore, India. Over the last few years, Geetha has been writing and presenting a series of papers on the theme of Crafting Change. Her interests lie in building and creating capacity for sustained and critical social change through the development of models at the primary, secondary, and tertiary areas of education. Geetha has a strong interest in new media arts and works actively at promoting this as an educator and as a curator.

Quenton Narcisse is currently a senior at Pathways High School in Hartford, Connecticut, and is the lead programmer on his class team. This was his first year in the Connecticut Innovation Academy program. As chief game designer, he has learned the Scratch program and taught classmates how to program.

Sharon Neff, a National Board Certified Teacher, teaches at Orchard Park Elementary in Fort Mill, South Carolina. She has her master's degree and specialist degree from the University of Florida. Currently she integrates a variety of Web 2.0 content areas into her technology curriculum including wikis, blogs, podcasting, and other Web 2.0 tools.

Jennifer Nelson is partnership coordinator (digital inclusion) at the Hennepin County Library in Minneapolis. Since 2006, she has worked closely with Keith Braafladt bringing Scratch programs to local youths. Her passion is finding ways for users to bring the best of their creative selves to the digital world.

Liddy Neville's computing interests began with Logo and how children engage with computers. As the Web developed, she became involved addressing problems of accessibility for people with permanent disabilities. Most recently, she has become involved with helping children and teachers in developing countries.

Juan Carlos Olabe was born in Spain. He received the PhD in telecommunications engineering from the Universidad Politécnica de Madrid in 1983. He briefly worked with MIT's Dennis Klat in the implementation of the Spanish version of MITalk. In 1986 he joined the faculty of Christian Brothers University, Memphis, Tennessee. He is professor of electrical engineering.

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Jill Pears is director of ICT at Selwyn House School, New Zealand. She is completing her MEd, focusing on the use of educational technologies. She teaches computer programming using Scratch, and runs after-school clubs where students work on computer programming and robotics.

Kim Pearson is an associate professor of English at the College of New Jersey, specializing in writing for journalism and interactive multimedia. Over the course of a thirty-year writing and reporting career, her articles have been published in venues ranging from the *Online Journalism Review* to *Black Enterprise Magazine*.

Kylie Pepler is an assistant professor of learning sciences in the School of Education at Indiana University, Bloomington. She was awarded a Spencer Dissertation Fellowship, as well as a University of California Presidential Postdoctoral Fellowship, for her work with Clubhouse youths using Scratch as a platform for making media art.

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Monisha Pulimood teaches courses in databases and software engineering with an emphasis on creating socially relevant responsible solutions. Her research, however, includes multidisciplinary collaboration in grid computing. She is interested in how the Scratch culture supports collaborative problem solving that motivates students to learn important concepts of software design in a socially relevant context.

Nikhil Pulimood likes to build things, especially with his grandfather. His mother gave him the challenge of solving a classic introductory computer science problem in Scratch. He will talk about how he adapted the classic problem to Scratch, and then extended it.

Karen Randall has taught in Minnesota for twenty-four years, following a master's in education from Bank Street College in New York. She is nearing completion on a K-12 principal's license through the University of Minnesota. She prefers multi-age, nontraditional programs that support time for thematic projects and building relationships with families.

Emilie Reiser manages grant-based programs. She worked with the New York City DOE to organize a series of workshops for students and teachers to learn animation and game design with Scratch. Emilie graduated with a degree in Latin American studies and politics and lived in Brazil, implementing innovative technology projects with favela youths.

Mitchel Resnick is professor of learning research at the MIT Media Lab and director of the Lifelong Kindergarten research group. His research focuses on the design and study of new technologies, such as Scratch, that engage people in creative learning experiences.

Gregory Rosmaita is vice-chair and webmaster for the Open Accessibility (A11y) workgroup at the Linux Foundation. He has been an invited expert to the World Wide Web Consortium since 1997. He is also a founding member, minister of propaganda, and former president of the Visually Impaired Computer Users' Group of New York City.

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Eric Rosenbaum is the author of "Ewe and Me," a Scratch animation showing a stuffed sheep crawling into his shirt. He is a graduate student in the Lifelong Kindergarten research group, and holds an AB in psychology and an MEd in education from Harvard University.

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Kimberly Scott serves as COMPUGIRLS executive director. Kimberly earned her EdD from Rutgers University and is currently an associate professor in the Educational Leadership and Policy Studies Department at Arizona State University. Prior to coming to ASU in August 2006, she was associate professor in Foundations, Leadership and Policy Studies at Hofstra University.

Wendy Seltzer will be a visiting professor at American University's Washington College of Law, studying intellectual property, privacy, and free expression online. As a fellow with Harvard's Berkman Center for Internet & Society, Wendy founded and leads the Chilling Effects Clearinghouse, helping Internet users to understand their rights in response to cease-and-desist threats.

Bharat Shah is a newly-qualified teacher who works with children ages 5 to 11. Based in Manchester, England, he is interested in developing a games-based curriculum, which will involve children learning through the making and playing of games. Scratch naturally provides a platform for realizing this vision.

Jiwon Shin is a doctoral student in instructional technology and media at Teachers College, Columbia University. Her research interests include development of instructional video games, social dynamics of online communities, and enculturation on the Internet.

Jay Silver was raised by a pack of hippies and midwives, and has been a go-go dancer, a Taco City busboy, a statistics professor, the Krazy Ice Cream Man, and a yoga instructor. Now he designs for Skin-to-Skin Contact and Urban Exploration in the Lifelong Kindergarten research group at the MIT Media Lab.

Brian Silverman is co-founder and president of the Playful Invention Company. After graduating from MIT, he worked for many years as director of research at LCSl, the world's leading developer of Logo software. He serves as a part-time consulting scientist to the MIT Media Lab, where he has helped develop many new educational technologies, including Scratch and Cricket.

Venice Sterling is currently a junior at Pathways. As the project manager of the "TekRush" team she is responsible for the work of twenty classmates across five divisions: writers, multimedia, marketing, game development, and web design. Visit <http://ctxpo.org/projects/HartfordPathway/>

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André Williams earned his bachelor of arts in philosophy with honors in 1994 from Kenyon College in Ohio. He specializes in technology and culture, researching how the two are dynamically linked to one another. André creates new forms of art, media, and technology, concentrating both on experimental and educational purposes.

Ursula Wolz has taught programming for thirty years. She continues to struggle with how to communicate to novices the joy of programming. For her, Scratch provides a vehicle through which to thoroughly engage students in an experience that is relevant and fun while focusing on essential concepts of programming.

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