

Wednesday, August 11

12:00 Registration and Lunch

1:00 **Pre-Conference Workshops**

These workshops required additional registration fees.

525 Creative Storytelling with WeDo and Scratch

Add a new dimension to creative storytelling by combining the new LEGO WeDo robotics kit with Scratch software. At this hands-on workshop, you'll learn to connect the physical world with the virtual world, creating stories that combine LEGO robotic characters with Scratch animated characters. It's art, design, science, and engineering all wrapped in one.

493 Introduction to Scratch: Animate Your World

New to Scratch? Not sure what it's all about? In this session, members of the MIT Scratch team will share the ideas and philosophy that inspired Scratch, as well as highlights and surprises from Scratch's first few years. The session will include a hands-on introduction to help you create your own interactive Scratch animations and share them on the Scratch website.

244 Sensing the World with the Scratch Sensor Board

Make a hand puppet that interacts with sprites on the screen, or a physical steering wheel that controls a car-racing game. In this hands-on workshop, you'll learn to use the Scratch Sensor Board to connect your Scratch project to the physical world. Combine sensors with craft materials to make new types of interfaces, and create programs that respond to light, sound, and other inputs from the world.

240 Exploring Advanced Programming Concepts through Game Design

Iteration, and conditionals, and variables – oh my! In the process of creating interactive projects with Scratch, young people can learn general problem-solving skills and specific programming concepts. In this hands-on workshop, we will explore advanced programming concepts (including iteration, conditionals, variables, and data structures) by creating interactive games with Scratch.

4:00 End of Pre-Conference Workshops

Thursday, August 12

8:30 Registration and Continental Breakfast

9:30 **Welcome and Keynote Session**

Reimagining Scratch, Reimagining Learning

Mitchel Resnick, Professor of Learning Research, MIT Media Lab

Amon Millner, MIT Media Lab

Andrés Monroy-Hernández, MIT Media Lab

Karen Brennan, MIT Media Lab

10:30 Break

11:00 **Concurrent Sessions**

Event Space **Let's Get Together: Creating Scratch Workshops for Informal Settings**

Jennifer Nelson, Keith Braafladt, Natalie Rusk

633 **Helping People Get Started with Scratch: Approaches and Trade-offs**

Karen Brennan

525 **Using Scratch in Multiple Settings: Productive Intersections for Learning and Identification**

Deborah Fields

Encouraging Creators Rather than Consumers

Margaret Low

240 **TagMat: An RFID Construction Kit for Developing Interactive Story Mats**

Roger Meintjes

Programming by Voice with Scratch: Teaching a Cat to Obey a Bird

Jeff Gray, Ramaraju Rudraraju, Srinivasa Datla, Avishek Banerjee, Mandar Sudame, Dixon

Shuttleworth, Gray Edwards

244 **Self-Organized Session**

493 **Self-Organized Session**

12:00 Lunch

1:30 **Concurrent Sessions**

Event Space **Computational Thinking for Everyone**

Yasmin Kafai, Mitchel Resnick

633 **Scratch in Irish Secondary Schools**

Clare McInerney

Teaching and Learning Scratch in Schools Around the World

Juan Carlos Olabe, Xabier Basogain

525 **Beyond Programming: A Collaborative Learning Environment Powered by Scratch, PicoBoard, and Traditional Media**

Yoshiro Miyata, Yasushi Harada, Nobuyuki Ueda, Tomoyuki Sowa, Kazuzi Mogi, Ryoko

Matsumoto, Keiko Onishi, Chihiro Tetsuka

240 **Scratch in the Science Olympics**

Andrew Harris

Young Developers: Kids Developing Computer Games with Scratch

Amitai Gat

244 **Self-Organized Session**

493 **Self-Organized Session**

2:30 Break

3:00 **Concurrent Sessions**

Event Space **Migrating a Scratch-Based After-School Program to the Middle School Classroom**
Ursula Wolz, Meredith Stone, Laura Fay, Suzanne Gallagher

633 **LEAD Creative Class in Hong Kong**

Felicia Tsang

Teaching Scratch to Educators in Bolivia as an Educational Transversal Tool in Schools with a Multicultural Approach

Christopher Neeskens Flores, Silvia Karina Maldonado

525 **Driving and Flying with Scratch and the LEGO WeDo**

Keith Braafladt

240 **Scratch in the Elementary School Classroom**

Bruce Cichowlas

Adventures in Cyberschooling with Scratch

Amanda Manthorpe Davies, Will Davies

244 **Self-Organized Session**

493 **Self-Organized Session**

4:00 End of Concurrent Sessions

4:30 **Dinner Excursions**

Want to continue the conversation? Join other participants on a trip to a local restaurant. We've made reservations at 5 restaurants: Wagamama, Desi Dhaba, Royal East, The Similians, and The Cheesecake Factory. Sign up at the Information Desk to join one of the dinner excursion groups.

Friday, August 13

8:30 Registration and Continental Breakfast

9:30 **Keynote Session**

Rethinking Identity, Rethinking Participation

Sherry Turkle, Professor of the Social Studies of Science and Technology, MIT

Henry Jenkins, Professor of Communication, Journalism, and Cinematic Arts, USC

Moderator: Marina Bers, Associate Professor of Child Development, Tufts University

10:30 Break

11:00 **Concurrent Sessions**

Event Space **Past, Present, and Future of the Scratch Online Community**

Andrés Monroy-Hernández, Amos Blanton, Joren Lauwers

633 **Pedagogy and Curriculum for Video Game Programming Using Scratch**

Cameron Fadjo, JeeHye Hong, Chun-Hao Chang, Ellen Geist, Jeong-han Lee, John Black

Gaming the News: Scratch and Media Literacy

John Landis

525 **Exploring Computational and Musical Thinking through Musical Live Coding with Kids in Scratch**

Alex Ruthmann, Jesse Heines

240 **Integrating Scratch Programming as a Tool for Assessment in K-12 Curriculum**

Leslie Daniels, Bobby Jeanpierre

What's My Grade?

Jane Harris, Clive Dawes

244 **Self-Organized Session**

493 **Self-Organized Session**

12:00 Lunch

1:30 **Concurrent Sessions**

Event Space **Ideas Shaping the Scratch Language**

Natalie Rusk, John Maloney, Brian Silverman, Paula Bontá

633 **Improving Student and Teacher Computing Confidence with Scratch**

Barbara Jane Ericson

Expanding Girls' Perceptions of Computing with Scratch Programming

Leslie Daniels

525 **Imagine, Program, Share: Conversations about Scratch in Schools**

Karen Randall, Bruce Cichowias, Ai Boon Tan, Mukhtar Masood Rana, Frank Sabate

240 **Immersed in Scratch**

Asger Schmidt

Scratch and Students on the Autism Spectrum

Barb Manchee

244 **Self-Organized Session**

493 **Self-Organized Session**

2:30 Break

3:00 **Concurrent Sessions**

Event Space **Scratch and the XO**

Claudia Urrea, Liddy Nevile, Alia Carter, Pacita Peña

633 **Scratch at the College Level: The Beauty and Joy of Computing**

Daniel Garcia, Colleen Lewis, Brian Harvey, George Wang, Stephanie Chou, Jens Moenig

A CSO Course Using Scratch

Mona Rizvi, Thorna Humphries, Debra Major, Meghan Jones

525 **Introducing the Ichi-Board, a Next-Generation Sensing Board for Scratch**

Mark Sherman

240 **Scratching in Mexico 2.0**

Jeanene Bluhm

Little Teachers: Young Students Becoming Teachers in Creative Robotics Projects

Lula Garcia

244 **Self-Organized Session**

493 **Self-Organized Session**

4:00 Break

4:30 **Posters and Demonstrations**

6th Floor **3 Scratchers: A Collaborative and Exploratory Workshop**

Seung Joon Choi

Clutter: Connecting Scratch Projects

Paul Medlock-Walton

Engaging Scratch Robotics for Under \$30

John Galinato

Higher Ceiling and Wider Walls with HelloBoard

SeungBum Kim, DongHee Park

Maestro: A Gestural Interface for Scratch Programming

Tom Benton, Taylor Martin, Matthew Berland

Mobile Scratch Development Environments on Android Cell Phones: Usability and New Features

Wolfgang Slany

Modkit: A Mixture of Scratch-Inspired Blocks, Motors, Sensors and More

Edward Baafi

National Educational Technology Standards (NETS) and Scratch

Linda George

PaPeRoch: A Research Project for Co-Creation Using a Communication Robot and Scratch

Daishi Kato, Manabu Sugiura

Scratch Resources: An Online Environment for Sharing Building Blocks of Scratch Projects

Joren Lauwers

Scratchable Devices: We'd Like to Teach The World to Code

Jordan Ash, Monica Babes, Gal Cohen, Sameen Jalal, Michael Littman, Luis Piloto, Phillip Quiza, Blase Ur

Sprite as a Breed

Evgeny Patarakin

Standards in Digital Technology in the Costa Rican Educational Informatic Program: Our Experience Using Scratch

Andrea Anfossi

Thinking Scratch as a Learning Environment: Tiles, Math, Interactions, and Knowledge

Ana Virginia Quesada, Efraín López

Using S4SL in Second Life and OpenSim

Daniel Green

VirtualSandbox: Adding Groupware Abilities to Scratch

Timo Goettel

5:30 [Dinner in the Courtyard](#)

Barbecue (with vegetarian-friendly options) and ice cream social

Saturday, August 14

8:30 Registration and Continental Breakfast

9:30 **Keynote Session**

Remixing School, Remixing Teaching

Ingrid Gustafson, Cambridge Public Schools
Marie Hopkinson, Westborough Public Schools
Carol Alcusky, Westborough Public Schools
Lillian Senna, Cambridge Public Schools
Luke Sciarappa, Westborough Public Schools
Bianca Homberg, Westborough Public Schools
Moderator: Karen Brennan, MIT Media Lab

10:30 Break

11:00 **Concurrent Sessions**

Event Space **Bringing “No Ceiling” to Scratch: Can One Language Serve Kids and Computer Scientists?**

Brian Harvey, Jens Moenig

633 **Scratch for Lifelong Learning: Experiences in a Master’s-Level Teacher Education Program**

Anthony Hursh

Programming & Writing: Opportunities for Learning about Code and Composition

William Quinn Burke

525 **DesignBlocks: Scratch’s Cool, Graphic Designer Sibling**

Dan Haeg, Evelyn Eastmond, Keith Braafladt

240 **Sense in *My Digital Life***

Rob Griffiths, Arosha Bandara, Mike Richards, Neil Smith, John Woodthorpe

AR SPOT: Authoring Augmented-Reality Experiences through Scratch

Iulian Radu

244 **Scratch in Math and Science Classrooms**

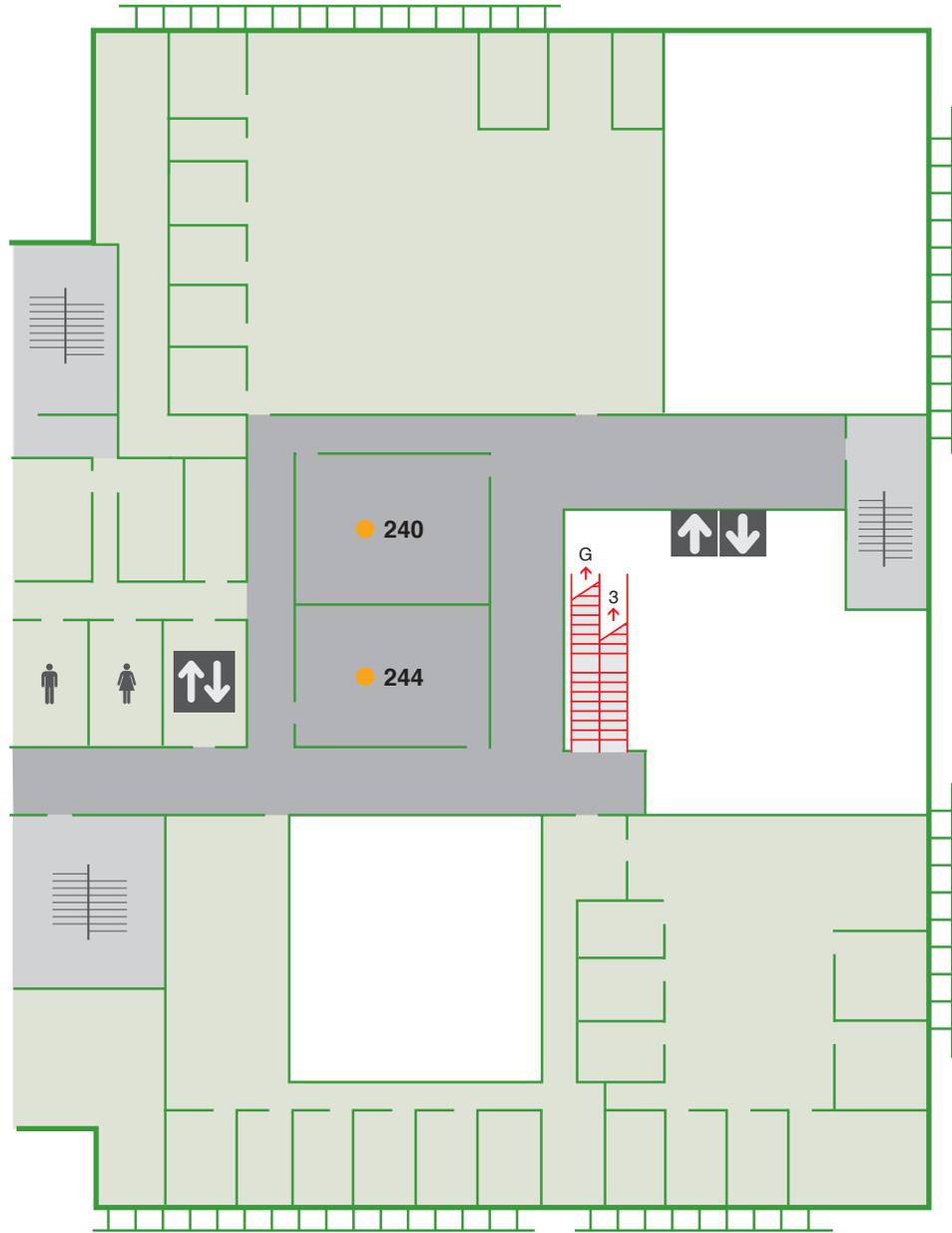
Behrouz Aghevi, Karen Randall, Nevit Dilmen, Nikos Dapontes

493 **Self-Organized Session**

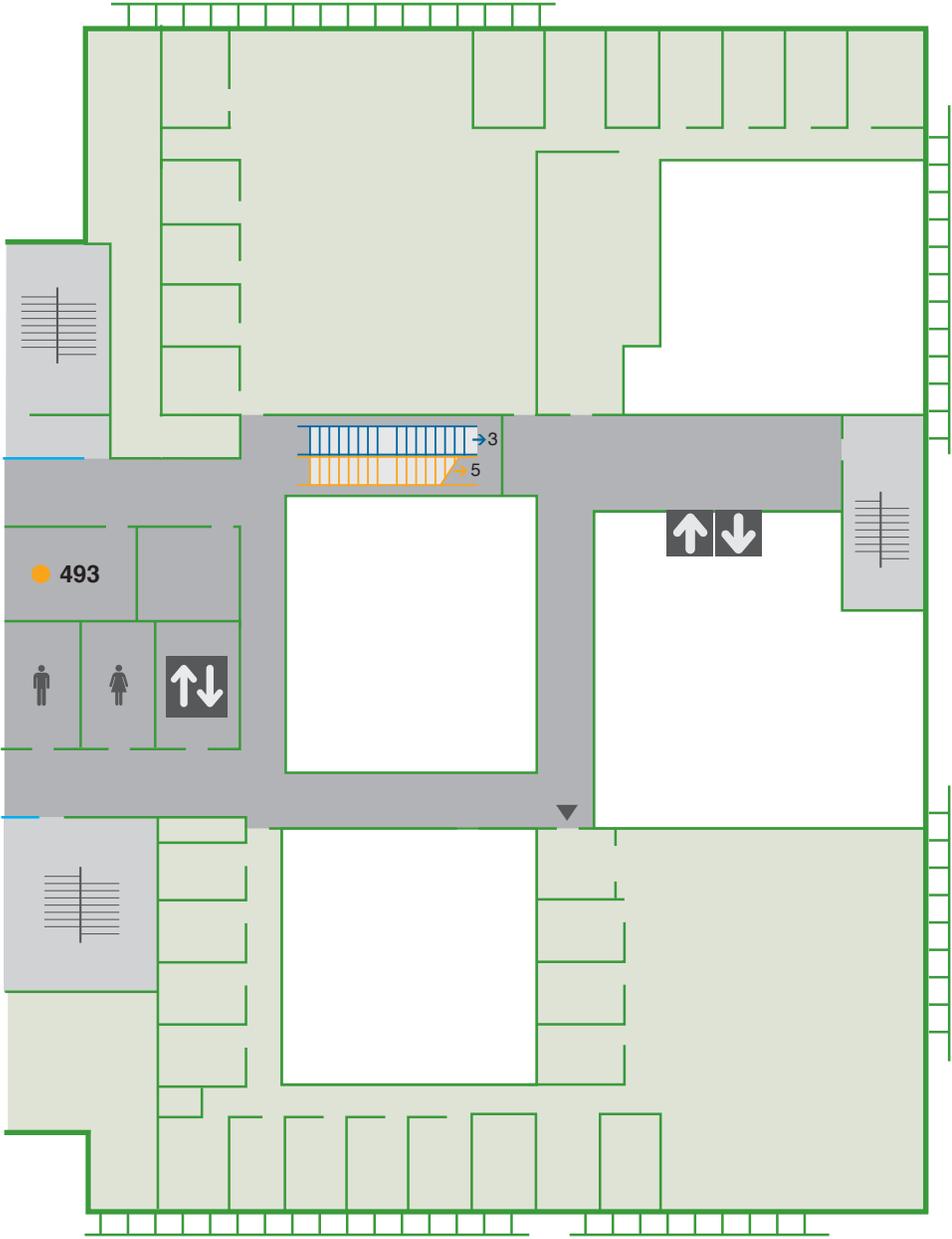
12:00 **Lunch and Closing Remarks**

1:30 End of Conference

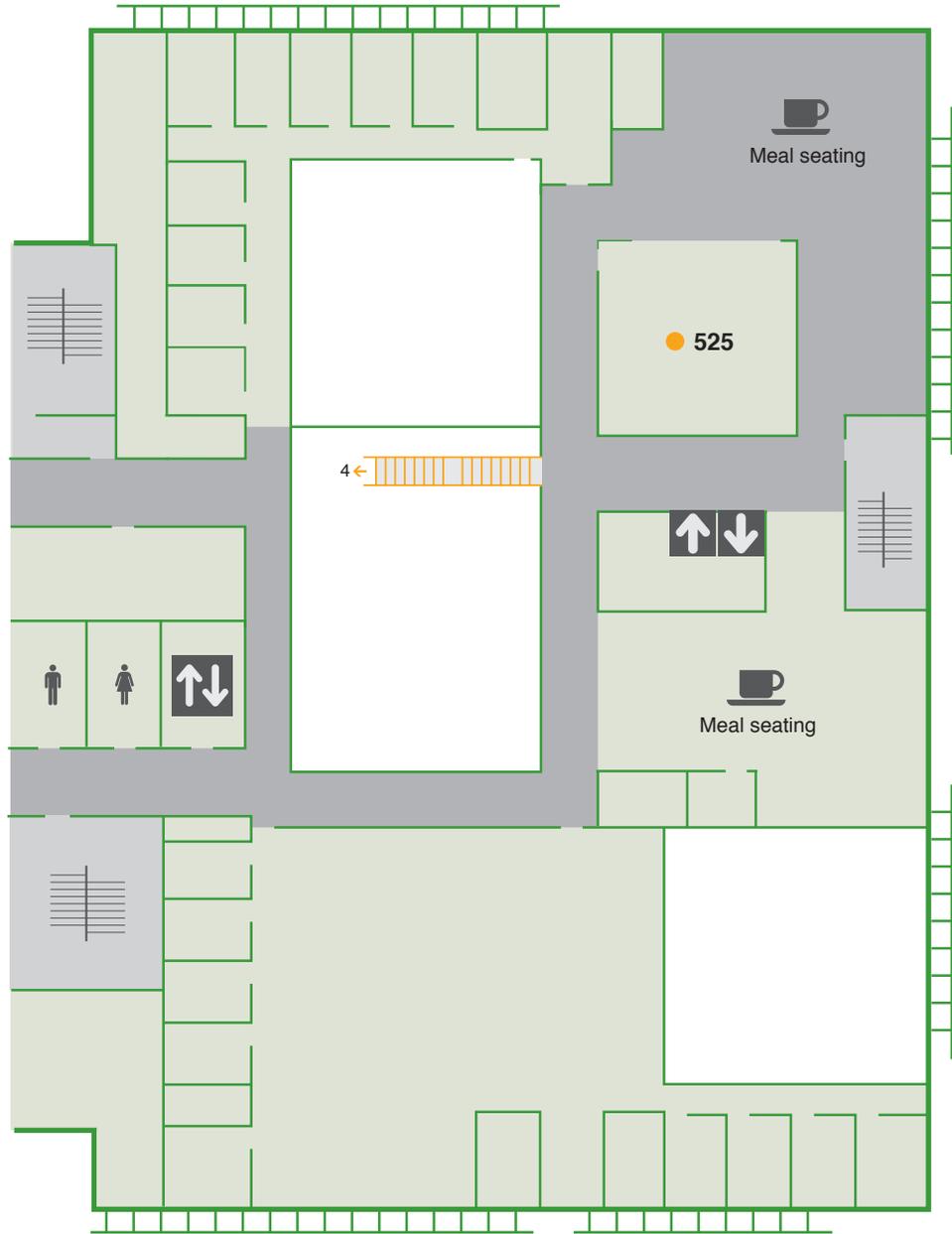
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Fifth Floor



Sixth Floor



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Getting Out

Acknowledgements

Welcome!

A lot has changed since the first Scratch@MIT conference in 2008.

Back then, there were fewer than 200,000 projects on the Scratch website. Now, there are more than 1.2 million projects.

Back then, people were using Scratch primarily in homes and after-school centers. Now, the use of Scratch in schools is growing rapidly – from elementary schools to universities.

Indeed, change is an important part of the culture in the Scratch community. Every time I look at the Scratch and ScratchEd websites, I'm excited to see a nonstop flow of new ideas – new types of projects, new forms of collaboration, new strategies for teaching and learning.

Change will be a central theme at this year's Scratch@MIT conference too. Organized under the banner of reimagine, rethink, remix, the conference provides opportunities to build upon what you're already doing with Scratch and explore new possibilities. At panels, presentations, and workshops, you'll get a chance to share ideas, experiment with new technologies, discuss research results, establish new collaborations, and develop new visions.

I'm looking forward to sharing some of the ideas and plans that we've been developing at the MIT Media Lab – and learning more about what others have been doing in the Scratch community. Together, we can reimagine, rethink, and remix our ideas about not only Scratch itself but about learning, education, creativity, and community.

Mitchel Resnick
Professor of Learning Research
MIT Media Lab

reimagine

It is creative apperception more than anything else that makes the individual feel that life is worth living.

Playing and Reality, D.W. Winnicott

Thursday Keynote

Reimagining Scratch, Reimagining Learning

Mitchel Resnick, Professor of Learning Research, MIT Media Lab

Amon Millner, MIT Media Lab

Andrés Monroy-Hernández, MIT Media Lab

Karen Brennan, MIT Media Lab

Scratch is designed to engage the imagination – provoking people to imagine new types of stories and games, new ways of using computers, new strategies for learning. Members of the MIT Scratch Team open the conference by sharing experiences from the first three years of Scratch and discussing how they are imagining future possibilities for Scratch and learning.

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. In addition to Scratch, he led the development of the programmable bricks that inspired the LEGO Mindstorms robotics kits, and he co-founded the Computer Clubhouse network of after-school learning centers for youth from low-income communities.

Amon Millner recently completed his PhD with the MIT Media Lab's Lifelong Kindergarten research group. He has led 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 candidate at the MIT Media Lab doing research in social computing. He 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 México.

Karen Brennan is a PhD student at the MIT Media Lab. Her research focuses on the development of technologies and environments to support communities of (creative) practice, particularly Scratch educators. She holds a BSc and BEd in computer science and math, and an MA in curriculum studies from the University of British Columbia.

Concurrent Sessions, Thursday 11:00-12:00

Event Space Let's Get Together: Creating Scratch Workshops for Informal Settings

Jennifer Nelson, Keith Braafladt, Natalie Rusk

We have spent much of the last four years trying to find the most effective ways to bring the wonders of Scratch to kids and adults in public libraries. Through our collaboration, we've developed an approach to teaching that reflects the best principles of positive youth development and the realities of an informal drop-in setting. We've learned that "space is the place": creating an inviting and persistent context for new programs for tweens and teens is essential. We have also been learning about building communities, establishing Scratch as a basis for technology programming in public libraries that champions youth as teachers and staff as co-learners. In this panel, we will share what we have learned and discuss how our work could help others teach Scratch to adults and kids.

633 Helping People Get Started with Scratch: Approaches and Trade-offs

Karen Brennan

What are different approaches to introducing people to Scratch? What are the trade-offs? In this session, I will share examples of approaches that have been used for helping people get started with Scratch and discuss what has (and hasn't) worked.

525 Using Scratch in Multiple Settings: Productive Intersections for Learning and Identification

Deborah Fields

As educators, we usually discuss the challenges and opportunities for using Scratch in a single social setting: a clubhouse, a classroom, or online. But what happens when youth use Scratch in multiple settings? In this presentation, I will discuss how youth at one school used Scratch in different settings and how those settings could be complementary in terms of their learning and identification with Scratch. First, I will share how members of an after-school club gradually took up opportunities to participate in the online Scratch site. Then, focusing on two case studies, I will demonstrate how using Scratch in the after-school club and in a math class provided youth with opportunities to be treated as experts and to deepen their knowledge of Scratch in ways that would not have been available in a single space. Finally, I will consider some of the underlying reasons why using Scratch in multiple settings might be beneficial.

Encouraging Creators Rather than Consumers

Margaret Low

In today's complex software development environments, there are significant hurdles to overcome in order to be able to develop the simplest of software applications. While today's generation of children are familiar with many computer games, it is hard for them to know where to start to express their own ideas for computer games. In this presentation, I will describe the voluntary activities of a group of students and staff from the University of Warwick, delivering Scratch workshop sessions to primary school children. The main objective of the workshops is to introduce the concept of software development, and raise awareness of Scratch as a good tool within schools. The workshops also provide an opportunity for primary school children to have contact with University students, and raise awareness of future educational opportunities. This year, the volunteers have taken a single workshop into a number of local schools.

240 TagMat: An RFID Construction Kit for Developing Interactive Story Mats

Roger Meintjes

In this presentation, I will describe TagMat, an RFID construction kit for developing interactive story mats. The mats serve as tangible interfaces for computer programs authored with the Scratch programming language. TagMat builds on the idea of the classroom and library story mat – a space for sharing stories – imbuing it with a range of new expressive and learning possibilities. With TagMat young people author and record their own stories, design and construct the interfaces for activating and illustrating these stories, and program the narrative structure in Scratch. The kit has been used in an initial series of workshops with users in the current target age group (9-14) and first year university students studying art education and design. I will describe the workshops and share observations on how participants responded to the challenge of collaboratively authoring interactive story mats.

Programming by Voice with Scratch: Teaching a Cat to Obey a Bird

Jeff Gray, Ramaraju Rudraraju, Srinivasa Datla, Avishek Banerjee, Mandar Sudame, Dixon Shuttleworth, Gray Edwards

The MYNA project provides an ability to write Scratch programs through programming by voice. Friendly programming environments like Scratch are typically driven by the WIMP metaphor (Window, Icon, Menu, Pointing Device). Such a mode of program input can be limiting to those with physical disabilities due to the required dexterity to interact with a mouse and keyboard. A key objective of the project is to imitate the common mouse and keyboard interactions with a voice-driven interface that is customized for Scratch. In this presentation, we will describe our initial efforts to support programming by voice in Scratch in a manner that does not require any invasive changes to the Scratch source code. We will share our motivation for the project, the technical implementation details, and some initial plans to evaluate the project with children who have disabilities. The project is sponsored by a Google Research Award.

244 Self-Organized Session

493 Self-Organized Session

Concurrent Sessions, Thursday 1:30-2:30

Event Space **Computational Thinking for Everyone**

Yasmin Kafai, Mitchel Resnick

Computational thinking is a set of concepts and practices that are drawn from the world of computing. Over the past several years, there has been growing recognition of the importance of computational thinking for understanding and solving problems in a wide range of contexts, not only in the field of computer science. But despite this increased recognition and relevance, there is a lack of clarity about what computational thinking encompasses and how to best support the cultivation of computational thinking, particularly in ways that broaden participation. In this session, we will discuss various conceptualizations of computational thinking, strategies for cultivating computational thinking, and ways that these conceptualizations and strategies can make computational thinking more broadly accessible.

633 **Scratch in Irish Secondary Schools**

Clare McInerney

Lero – the Irish Software Engineering and Research centre runs an Education and Outreach Programme to increase awareness and encourage interest in software engineering and computer science at second-level education in Ireland. At the 2008 Scratch conference we presented our plans to develop a set of teaching materials for secondary schools students. Since then, we have developed a 45-hour set of materials titled *Having Fun with Computer Programming and Games*. The materials were distributed to all secondary schools in Ireland in September 2009. The materials teach computational concepts using Scratch. The materials include a computational thinking component that uses the Computer Science Unplugged materials. In this presentation, we will discuss the development of the Scratch teaching materials, the pilot project that ran during the academic year of 2008-2009, reactions from teachers and students, and our plans to run a Scratch competition in Ireland. All materials are available at <http://www.scratch.ie>

Teaching and Learning Scratch in Schools Around the World

Juan Carlos Olabe, Xabier Basogain

Since its initial launch in the summer of 2007, the tutorials of LearnScratch.org have been viewed in schools of 142 countries. In this presentation, we describe the main phases in the evolution of the site. In addition to the direct viewing of the tutorials from the site, schools and institutions wishing to install these materials into their own computers and networks can receive from LearnScratch.org a DVD containing the totality of the materials. Currently over 1300 schools and institutions around the world have requested these materials. Finally, in the summer of 2010, a new update of the website will be released. This third version of the website will add a new set of projects specially designed to integrate Scratch into the technology curriculum in schools in the US and abroad. These projects are grouped by grade level and include references to school standards.

525 **Beyond Programming: A Collaborative Learning Environment Powered by Scratch, PicoBoard, and Traditional Media**

Yoshiro Miyata, Yasushi Harada, Nobuyuki Ueda, Tomoyuki Sowa, Kazuzi Mogi, Ryoko Matsumoto, Keiko Onishi, Chihiro Tetsuka

For many children, Scratch has changed the meaning of the personal computer from a black box to a system that they can understand and create – a theater where the audience can step up on the stage to perform. In this workshop, we will create a theater featuring *Poppet*, a puppet play inspired by Japanese traditional *Bunraku*, in which both the puppets and the performers are visible ingredients of the drama. By visualizing story-making processes with Scratch, the participants can collaborate in creating a story interactively through sound/light/touching enabled by PicoBoard/WeDo, and *Yubifude*, a revision of traditional brush for calligraphy, to share their imaginations. Like in Scratch@MIT 2008, real-time documentation will be used to bring a reflective perspective. Scratch has the potential to go beyond a programming environment, to create a theater where the audience can collaborate in every stage of expressive activity from imagining, creating, to reflecting.

240 Scratch in the Science Olympics

Andrew Harris

The National Science Olympics is a national science competition for middle school and high school students. This competition reinforces many science disciplines with interesting hands-on events. While programming instruction has actually decreased in our state, students are more interested in computing than ever. Many students express an interest in game development, but this topic is rarely covered in school curricula. In this presentation, I will share a proposal for a Scratch game programming event. In this event, teams of two have 50 minutes to produce a game using only a stock version of Scratch. This is currently a trial event in the state of Indiana, and we're hoping to make it a part of the national competition.

Young Developers: Kids Developing Computer Games with Scratch

Amitai Gat

SHITA (Integrating IT in Teaching and Learning) is a non-profit organization in Israel that has been teaching Scratch in a unique way for the past three years. We have developed a program called *Young Developers* in which we are teaching kids, ages 9-12, to develop computer games with Scratch. Our program is based on the principles of building and creating multidisciplinary projects that the kids investigate and then develop into educational games that were programmed in Scratch. The program involved developing a new pedagogical concept, training materials for instructors, and lesson plans for the students. In this presentation, I will discuss how SHITA adopted Scratch as the main tool for game development, what the implications are of teaching a new tool, and how Scratch can be a new pedagogical concept for staff and students.

244 Self-Organized Session**493 Self-Organized Session**

Concurrent Sessions, Thursday 3:00-4:00

Event Space Migrating a Scratch-Based After-School Program to the Middle School Classroom

Ursula Wolz, Meredith Stone, Laura Fay, Suzanne Gallagher

Over the past two years we established an interactive journalism after-school program that combines news reporting via text, video and Scratch projects. Language arts teachers involved in the program migrated core concepts and activities into the standard language arts curriculum, and are spreading a Scratch culture throughout the school. In this presentation, we will present activities from 7th and 8th grade, and show how we document – but more importantly foster – a network of Scratching teachers and students in a middle school. We will share how the Scratch culture was adapted to the existing school culture to empower both students and teachers. We will then engage the audience in a discussion of how we can sustain this model, as well as how this model can be adapted for other types of schools and age groups.

633 LEAD Creative Class in Hong Kong

Felicia Tsang

We want to achieve school-wide reform with LEAD Creative Class. When we first approach a school to introduce our ideas of educational reform, the teachers we work with are often those already interested in bringing multimedia technology into their classrooms. Scratch is one of the tools we introduce to these teachers, who are not yet experienced with delivery of a curriculum in the spirit of the 21st century design. Without adding onto the teachers' full schedules, we work with the teachers to modify the existing curriculum units already planned, without taking away any parts of the desired outcome. LEAD Creative Class is now being implemented in many schools in Hong Kong. Students' and teachers' descriptions of their first experiences of game development reflect changes in their mental models about learning. In this presentation, I will describe how two public schools in Hong Kong have achieved fundamental culture changes.

Teaching Scratch to Educators in Bolivia as an Educational Transversal Tool in Schools with a Multicultural Approach

Christopher Neeskens Flores, Silvia Karina Maldonado

In this presentation, we share the challenges of teaching Scratch in Bolivia. Over 90% of the public school system does not have computers. Schools also do not have appropriate curricula that include developing skills for effective use of information technologies and communication. In order to change this reality, we taught more than two hundred educators from all Bolivia at the *XV National Convention of the Bolivian English Teachers Association*, held in Potosi, how to use Scratch to teach the English language. An alliance with the national newspaper *El Deber* through its children's supplement called *Debercito* allows us to publish Scratch lessons to children and teachers once a week. In addition, we are starting a training period to teach Scratch for educators at the Universidad Católica Boliviana in Santa Cruz.

525 Driving and Flying with Scratch and the LEGO WeDo

Keith Braafladt

In this 60-minute workshop, we will offer participants a chance to get hands-on experience with the new LEGO WeDo robotic construction kit. With the release of version 1.4 of Scratch, people can now use a few simple Scratch blocks to control the motors and sensors of the WeDo. We will have WeDo construction kits available to try out. Participants will play with sensing and controlling movement in the physical environment through various Scratch WeDo projects. Then we will take a look at projects created by staff of the Learning Technologies Center in the Science Museum of Minnesota. We will have participants explore driving and flying games, connecting the physical and virtual world, and then encourage participants to tinker with WeDo, remixing or creating personal WeDo projects.

240 Scratch in the Elementary School Classroom

Bruce Cichowlas

I will present some of my experiences with an improvised computer lab curriculum for the second half of the school year in grades two through five featuring Scratch. Some topics were taught, initially, in short, very informal lectures. Scratch was completely new to the other faculty at the small private school and to most of the students and parents. An effort was made to direct students to parts of Scratch that might appeal to them most, such as the scripting, the art, the music, the presentation capabilities and the adaptation of games and projects made by others. Sharing projects, messages and friends in Scratch formed a model for social networking and generated some interesting discussions about appropriate sharing and privacy. I will also share the opinions and participation of the parents, as well as some actual student projects.

Adventures in Cyberschooling with Scratch

Amanda Manthorpe Davies, Will Davies

Cyberschooling is a rapidly growing segment of elementary education. We will share how we, as a cyberschooling family from Pennsylvania, use Scratch to enhance the K-12 curriculum supplied by Agora Cyber Charter School, our public elementary school. We use Scratch in our virtual classroom to teach students vital technology and problem-solving skills. Using a cross-curriculum approach, Scratch ties together art, history, math and technology lessons into fun, interactive projects. We will share how Scratch teaches students important teamwork and collaborative techniques. We will also share our lesson plans and projects created during school time exercises. In the presentation, one of the cyberschooling students will share his perspectives on the value of Scratch in the classroom.

244 Self-Organized Session**493 Self-Organized Session**



rethink

You can't think seriously about thinking without thinking about thinking about something.

Mindstorms, S. Papert

Friday Keynote

Rethinking Identity, Rethinking Participation

Sherry Turkle, Professor of the Social Studies of Science and Technology, MIT
Henry Jenkins, Professor of Communication, Journalism, and Cinematic Arts, USC
Moderator: Marina Bers, Associate Professor of Child Development, Tufts University

People often think about new technologies in task-oriented ways: how to access information, how to create projects, how to make presentations. But there is a more personal dimension to the role of new technologies in the lives of young people. In this session, Sherry Turkle and Henry Jenkins explore how young people, as they engage with new technologies, begin to change the ways they think about themselves, relate to others, and participate in communities.

Sherry Turkle is Professor of the Social Studies of Science and Technology in the Program in Science, Technology, and Society at MIT. Her research focuses on how people relate to objects and technologies in the world around them – and how new technologies influence the ways people think about themselves. Her books include *The Second Self: Computers and the Human Spirit*, *Life on the Screen: Identity in the Age of the Internet*, and *Evocative Objects: Things We Think With*.

Henry Jenkins is the Provost's Professor of Communication, Journalism, and Cinematic Arts at the University of Southern California. His research focuses on the relationship between media and popular culture – in particular, ways that media technologies can engage people in new forms of participation within communities. His books include *Textual Poachers: Television Fans and Participatory Culture*, *Convergence Culture: Where Old and New Media Collide* and *Fans, Bloggers and Gamers: Exploring Participatory Culture*.

Marina Bers is Associate Professor at the Eliot-Pearson Department of Child Development and Director of the DevTech Research Group at Tufts University. Her research focuses on the design and study of innovative learning technologies to promote children's positive development. She is author of *Blocks to Robots: Learning with Technology in the Early Childhood Classroom*.

Concurrent Sessions, Friday 11:00-12:00

Event Space **Past, Present, and Future of the Scratch Online Community**

Andrés Monroy-Hernández, Amos Blanton, Joren Lauwers

In this panel discussion, we will share how the Scratch community was originally conceived and how it has evolved over the past three years. We will talk about some of the cultural phenomena we have observed such as modding, Warrior Cats, collabs, remixing, coloring contests, and tensions between different groups. We will discuss some of our strategies and policies for moderation, and featuring of projects and galleries. We will also present some ideas for the future of the community with an approach more focused on a diverse ecosystem of websites, such as the Scratch wiki and others.

633 Pedagogy and Curriculum for Video Game Programming Using Scratch

Cameron Fadjo, JeeHye Hong, Chun-Hao Chang, Ellen Geist, Jeong-han Lee, John Black
Programming a video game involves coordinating a multitude of disciplines and skills. In this presentation, we will present an interdisciplinary curriculum for teaching video game programming to elementary school students using Scratch. Utilizing a constructionist learning approach, students design, develop, and program their own visual novel, sports or platform game. We will discuss curricular alignment with core content areas and outline a topic sequence that was used for an after-school program with urban 5th grade students during the 2009-2010 academic year. We will showcase the academic aspects of our interdisciplinary video game programming curriculum that guides young students through the design and development process while integrating core curricular topics, such as coordinate geometry and literary narrative, into the creative process.

Gaming the News: Scratch and Media Literacy

John Landis

In the summer of 2009, 60 students from a Northeast Philadelphia day camp were denied entry to a local swimming pool, leaving the students wondering if their race was the reason. When the pool's president said he was afraid the students would change the pool's "complexion," the story boiled over into the local and national media. Meanwhile some other Philadelphia children were having a very different camp experience. At Powerful Voices for Kids, a media literacy summer program, a group of fifth graders used the unique tool Scratch to reflect on the pool incident and its portrayal in the media by retelling the story as a video game. Using this project as an example, I will show how Scratch and video game design may be used within a media literacy curriculum, and discuss the unique opportunities and difficulties that arise from choosing video games as a learning product.

525 Exploring Computational and Musical Thinking through Musical Live Coding with Kids in Scratch

Alex Ruthmann, Jesse Heines

Scratch is a unique environment for creating original music and building musical instruments using external sensor boards. Over the past year, we've been exploring Scratch as a platform for teaching computational thinking in parallel to musical and compositional thinking with middle school through undergraduate students. In this workshop, we will begin with an interactive, live performance of music created with Scratch by middle school and undergraduate students from the University of Massachusetts, Lowell. We will then work with participants in small groups to compose and perform interactive, computational music using Scratch. Three modes of engagement with Scratch and music will be explored in small groups: pre-coding music compositions, musical live coding where code is written as part of an on-the-fly musical improvisation, or using PicoBoards as a musical instrument in performance. We will conclude the workshop with a performance of original compositions collaboratively created with workshop leaders and participants.

240 Integrating Scratch Programming as a Tool for Assessment in K-12 Curriculum

Leslie Daniels, Bobby Jeanpierre

Though Scratch has been successfully integrated into K-12 curriculum, its application has been limited. In this presentation, we will propose expanding Scratch's application in the form of an updated assessment tool. This workshop will describe an approach that was presented to students in a graduate-level seminar course on teaching math and science in an urban context. The use of Scratch to produce digital stories, animations, games, simulations, as well as its use in a laboratory setting, were described with a focus on assessment. Instructional videos illustrating how Scratch can be used as an assessment tool were developed as a resource for the participant teachers. Jing and CamStudio (freeware screen-capturing software) were used to create the instructional videos. The intent in using this software was to demonstrate how teachers could develop instructional videos to present Scratch programming in a manner specific to the needs of their students.

What's My Grade?

Jane Harris, Clive Dawes

We know kids get it, we know how much learning is involved in designing, building, sharing and remixing scripts and we know it's hard fun! What happens, however, when teacher-learners try to align Scratch projects with learning outcomes and assessment procedures and how do we convey this learning to parents? Might this be an opportunity to shift thinking in other directions? If we want young people to engage with their learning then we need to provide opportunities for both them and their parents to become increasingly discerning about what they have learned and how they have learned it. In this presentation, we share our processes of rethinking traditional, rubric-driven assessment practices, having infused Scratch into the mathematics curriculum through challenge-based investigations rather than delivered content. If learning is a collaborative process then assessment should no longer be driven by teacher-learners, it must include all stakeholders: teacher-learners, learners and parents.

244 Self-Organized Session**493 Self-Organized Session**

Concurrent Sessions, Friday 1:30-2:30

Event Space Ideas Shaping the Scratch Language

Natalie Rusk, John Maloney, Brian Silverman, Paula Bontá

What ideas and issues guide the design of the Scratch language? What were the biggest decisions made when creating the first version of Scratch? What opportunities and challenges are emerging for the design of Scratch 2.0? What should change and what should stay the same as Scratch programming becomes possible in web browsers? How can Scratch stay friendly for beginners while being responsive to suggestions from experienced Scratchers? In this panel, we will discuss the concepts and questions shaping the design of the Scratch language.

633 Improving Student and Teacher Computing Confidence with Scratch

Barbara Jane Ericson

Georgia Tech has been using Scratch since 2006 in our middle school summer camps, in our teacher workshops, in our after-school programs, and in weekend workshops with youth serving organizations. We have introduced hundreds of middle and high school students and teachers to computing using Scratch. In addition, we have seeded summer camps at ten other colleges and universities in Georgia. Scratch helps improve both students' and teachers' attitudes towards their ability to do computing. We measure students' attitudes towards computing and we find that Scratch significantly increases a student's perception that he or she is good at computing. We also do post surveys with the teachers and find that Scratch helps ease the transition from teaching computer applications to teaching computing concepts. In this presentation, I will provide details on our activities with Scratch and will compare and contrast the results we see from Scratch versus LEGO NXT, Alice, and PicoCrickets.

Expanding Girls' Perceptions of Computing with Scratch Programming

Leslie Daniels

In the last twenty-five years, the diversity of representation in the computer science industry has seen a marked decline. In this presentation, I share one initiative to reverse this trend: the Girl Scouts of America's STEM program that provides opportunities for its membership to explore the fields of robotics, optics and engineering. To expand on these opportunities, this workshop was developed to expose girls to the opportunities extant in the field of computer science. Young women currently pursuing a computer science career shared their career aspirations and the paths they have taken to achieve them. Scratch programming was introduced to the participants as a way to explore the diversity of multimedia products that can be produced with computer programming. In keeping with the leadership development focus of Girl Scouts, the participants used Scratch programming to construct a public service announcement espousing the opportunities for women in the field of computer science.

525 Imagine, Program, Share: Conversations about Scratch in Schools

Karen Randall, Bruce Cichowlas, Ai Boon Tan, Mukhtar Masood Rana, Frank Sabate

Sharing is a critical step in the cycle of Scratch projects, not an end point but an opportunity for new growth and reflection. Sharing and reflection are also important for educators as we seek to expand and deepen our practice. This group of international educators met online as a professional learning community over five months to reflect on teaching and learning with Scratch. We also developed a collaborative Scratch project between our students. In this panel, we will discuss the impact that sharing ideas and projects between teachers and between students has on learning and ways to facilitate sharing.

240 Immersed in Scratch

Asger Schmidt

Finding time during regular classroom lessons for introducing pupils to Scratch can be hard. It is, however, common for Danish schools to have several weeks during the year set aside for cross-curricular in-depth studies. It is, in fact, a part of the Danish Public Schools Aims to create room for in-depth studies. Using these weeks for a full immersion in Scratch will give pupils a solid knowledge of how the programming language works. This provides a useful tool for the pupils, especially in the last years of the Folkeskole (7th-9th grades) when focus shifts towards group work, projects and presentations. Nonetheless, it is still valuable for younger pupils in their ordinary classes. In this presentation, I share my experiences of teaching Scratch in various ways during immersion weeks.

Scratch and Students on the Autism Spectrum

Barb Manchee

Students on the autism spectrum have difficulties with communication, social interaction, and spatial awareness. In this presentation, I describe how our students have benefited from using Scratch. As they create Scratch games, stories, and animations, students develop skills in their deficit areas. The use of Scratch supports our math curriculum and social thinking lessons, strengthens sequential thinking and can be used as a study tool. Students learn programming while creating multimedia that teaches others. Using Scratch reinforces learning and allows students to process concepts in a different way. Examples of our student-created interdisciplinary projects can be seen at <http://scratch.mit.edu/users/Rm224>. Our students' use of Scratch has helped to build their self-confidence and strengthen their academic, technological and social skills.

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Concurrent Sessions, Friday 3:00-4:00

Event Space **Scratch and the XO**

Claudia Urrea, Liddy Nevile, Alia Carter, Pacita Peña

The inspiration for the development of the XO computer for young people worldwide who were disadvantaged with respect to education, as otherwise, was some of the exciting work led in previous decades by educators in the MIT Media Lab. In particular, finding a way for all children, everywhere, to take an active role in their own education and to be supported by constructionist pedagogies where teachers are available, is a dream often articulated by the OLPC teams worldwide. But what is the reality? How realistic are such goals? How can they be attained? In this panel, we will share our experiences of using Scratch and the XO.

633 Scratch at the College Level: The Beauty and Joy of Computing

Daniel Garcia, Colleen Lewis, Brian Harvey, George Wang, Stephanie Chou, Jens Moenig
Many introductory computer science courses mislead students into thinking that computer science is synonymous with programming. At UC Berkeley we have designed and piloted a new course focusing on big ideas in computer science – only some of which involve programming. Scratch forms the basis not only for our programming component but for making the big ideas in computer science tangible and comprehensible. We think we are the first to base an entire college semester, not just a few weeks, on Scratch. In this presentation, we will share the results from our pilot. We found that Scratch can provide a challenging course for college students and that the course could meet our hopes for preparation and recruitment of future computer science students.

A CS0 Course Using Scratch

Mona Rizvi, Thorna Humphries, Debra Major, Meghan Jones

Although computer science enrollment has increased recently, computer science departments are still faced with retention issues, particularly among freshman with weak math backgrounds. At Norfolk State University (NSU), more than half of first-year CS students who take CS1 in the Fall semester have either left the major or stopped actively attending the university by the Spring semester of the following year. For those students who scored poorly on the math placement exam, the figure is closer to seventy-five percent. We present a new Scratch-based CS0 course that was offered to Fall 2009 NSU freshman CS majors who placed into algebra or below. Our study aims to examine these students' future success in CS1, their retention rate in the major, and their attitudes about computer science.

525 Introducing the Ichi-Board, a Next-Generation Sensing Board for Scratch

Mark Sherman

In this workshop, participants will experiment with the Ichi-Board in a hands-on workshop that will explore advanced sensing and real-world interaction techniques. The Ichi-Board has an onboard 3-axis accelerometer, powered sensor ports, and additional button inputs, all without changing Scratch or using network sensors. Participants will try out infrared distance sensors, 7-button controllers (without circuit hacking!), and Wii-style motion control. We will discuss how additional computer science fundamentals can be taught using these advanced features, including base-2 encoding and discrete signal processing.

240 Scratching in Mexico 2.0

Jeanene Bluhm

In this presentation, I will share what has happened after integrating Scratch as part of the curriculum in the three campuses of the Thomas Jefferson Institute in Mexico. At first it was integrated in the Technology Curriculum. Now, every teacher at the school has integrated it as part of their daily lessons while they use interactive whiteboards and apply the Creativity Spiral. I will also talk about some projects that have become established programs at ITJ, including an inter-campus Scratch Day, high school students liaising with foundations, mentoring public school teachers, and high school students mentoring kindergarteners.

Little Teachers: Young Students Becoming Teachers in Creative Robotics Projects

Lula Garcia

In this presentation, I will share the extracurricular program in robotics that we started in 2001 at Colegio Las Hayas, a private K-12 school in Xalapa, Veracruz. Since then, some of the young students have become so skillful and enthusiastic that we created a program for these students to become trainers and teachers. In addition to helping their peers, these little teachers teach adults in workshops planned by their teacher or invited by other institutions. This program has had a positive impact on the students' security, self-esteem, and perspectives on their future as people and professionals. The idea of training adults was never in their plans, but was accomplished thanks to their enthusiastic and outgoing personalities.

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remix

It is obvious that the teacher as organizer remains indispensable in order to create the situations and construct the initial devices which present useful problems to the child. Secondly, he is needed to provide counter-examples that compel reflection and reconsideration of over-hasty solutions. What is desired is that the teacher cease being a lecturer, satisfied with transmitting ready-made solutions; his role should rather be that of a mentor stimulating initiative and research.

To Understand is to Invent, J. Piaget

Saturday Keynote

Remixing School, Remixing Teaching

Ingrid Gustafson, Cambridge Public Schools
Marie Hopkinson, Westborough Public Schools
Carol Alcusky, Westborough Public Schools
Lillian Senna, Cambridge Public Schools
Luke Sciarappa, Westborough Public Schools
Bianca Homberg, Westborough Public Schools
Moderator: Karen Brennan, MIT Media Lab

Much of the early use of Scratch took place in homes and after-school settings, without the support afforded by formal learning environments. The adoption of Scratch in schools is essential for broadening and diversifying the community of young people who are using Scratch. In this session, three students and three teachers share their experiences with Scratch, both in and after school: how they've been working with Scratch, what they think of those experiences, and what they want to do next.

Ingrid Gustafson is a Technology Integration Specialist for Cambridge Public Schools, where she facilitates an after-school Scratch Club. A graduate of the University of Pennsylvania and Teachers College, Columbia University, she believes in the ability of technology to challenge and connect all learners.

Marie Hopkinson is the Westborough Public Schools Instructional Technology Specialist, 7th-12th grade. She works closely with teachers to improve curriculum delivery with the assistance of technology. Prior to entering the field of education, Marie worked as a corporate communications specialist in the United Kingdom.

Carol Alcusky has been a teacher in Westborough School District for over 25 years. She currently teaches Ancient Civilizations to grade 7 students at Gibbons Middle School. She received a BS in Education and an MS in Curriculum and Instruction from Lesley University.

Lillian Senna is 11 years old and lives in Cambridge, MA with her mother, step-father, and 1-year-old sister. She has been working with Scratch since 5th grade at the Baldwin elementary after-school program. Since she was a young toddler she has had a love of drawing and, most recently, focuses most of her drawing on manga. In her spare time, she enjoys karate, listening to music, hanging out with friends and babysitting for her sister.

Luke Sciarappa lives in Westborough, MA, with his parents, grandfather, and 10-year-old sister. He has taught his sister to use Scratch and she enjoys it a lot. Aside from programming, his main hobbies/sports include coin collecting, reading, karate, and gymnastics. He also enjoys listening to music, mostly classical, rock or fractal music.

Bianca Homberg is a rising senior at Westborough High School. She started using Scratch in eighth grade. She has been a youth mentor for the middle school Scratch Club. She helps students with their projects by demonstrating implementation of new techniques, guiding them towards a solution, or inspiring them with new areas to explore.

Concurrent Sessions, Saturday 11:00-12:00

Event Space **Bringing “No Ceiling” to Scratch: Can One Language Serve Kids and Computer Scientists?**

Brian Harvey, Jens Moenig

Some universities are developing computer science courses for non-majors using Scratch as the programming environment because it isn't threatening. But Scratch has weaknesses as a programming language. Most notably, it lacks procedures, so it can't display recursion, one of the central ideas of computer science. These weaknesses aren't oversights; the Scratch designers made it a priority to avoid introducing anything a child might find threatening. It has been proposed to split the Scratch community with two versions of the language. We believe that this is not necessary. In this presentation, we share how, by taking key ideas, such as procedures as first class data, from the Scheme language, we can add only a few features to Scratch and still make it powerful enough to support a serious introductory computer science curriculum.

633 **Scratch for Lifelong Learning: Experiences in a Master's-Level Teacher Education Program**

Anthony Hursh

In this presentation, I describe student-produced Scratch content from two graduate-level educational technology courses designed for working P-12 teachers. Beginner students often have little production experience – perhaps limited to word processors or spreadsheets, with much of their computing experience being consumption-focused. Although Scratch was designed for young people, these results suggest that it may be equally useful for introducing multimedia construction to adult teachers. Two distinct production models are discussed: creation of interactive content and creation of machinima (computer-generated films). I will present preliminary results from using Scratch in two iterations of two separate master's-level education courses, suggesting a high level of student success and satisfaction with Scratch, and will demonstrate several student projects.

Programming & Writing: Opportunities for Learning about Code and Composition

William Quinn Burke

In this presentation, I will focus on how basic programming activities through Scratch can also help students develop as writers. I will share how middle school children from a West Philadelphia public school used Scratch to create their own digital stories and how the narrative structure of these stories offers students the opportunity to better understand the writing process. While there have been a number of efforts examining how learning to write code can be facilitated by storytelling, there has been little exploration as to how such creative coding can also be directed to teach students about narrative and storytelling. Using the cognitive framework of a study grammar, I will present one particular group of students' programmed digital story in terms of the creative writing components it exemplifies.

525 **DesignBlocks: Scratch's Cool, Graphic Designer Sibling**

Dan Haeg, Evelyn Eastmond, Keith Braafladt

In this workshop, participants can try out DesignBlocks, a Scratch-based programming language that lets people create, remix, and share imagery online using a familiar block-based language. We will introduce the new language, facilitate a design activity, and share results from trial workshops. DesignBlocks was initially conceived as a means for undergraduate art students to apply the fundamentals of programming and algorithms towards the creation of generative art. We will discuss other potential audiences and applications while creating and sharing our own designs.

240 Sense in *My Digital Life*

Rob Griffiths, Arosha Bandara, Mike Richards, Neil Smith, John Woodthorpe

In this presentation, we will describe Sense, an implementation of Scratch with two open-sourced extensions: an enhanced sensor board with motors and LEDs, and support for reading and writing information over the internet via RSS. It was developed for *My Digital Life*, an introductory course at the Open University, UK, to be taught entirely at a distance and accessible to non-computing specialists. It covers the fundamentals of computing, IT and communications systems, using ubiquitous computing as the overarching theme. The extended board allows students to build smart devices that interact with the physical world. Supporting RSS allows students to communicate via Sense (including showing presence and playing games) and build programs that create and use crowd-sourced information.

AR SPOT: Authoring Augmented-Reality Experiences through Scratch

Iulian Radu

AR SPOT is an extension of Scratch, where augmented-reality (AR) capabilities have been added to the children's programming platform. This environment allows Scratch users to create programs that mix real and virtual spaces: users can display virtual sprites on real-world spaces seen through a camera, and they can use physical interactions to control the virtual environment. In this presentation, I will first describe the system design process, which focused on appropriately presenting the AR technology to a young population, as influenced by knowledge of child spatial cognition, programming expertise, and interaction metaphors. I will then present evaluation strategies, accompanied by results from an initial pilot study, as well as discussion of foreseeable impacts on the Scratch user community.

244 Scratch in Math and Science Classrooms

Behrouz Aghevli, Karen Randall, Nevit Dilmen, Nikos Dapontes

Classroom-ready Scratch projects are a great tool for enhancing math and science learning in school. The activities, games, and demonstrations that are developed by educators for this purpose are an excellent starting point for students to explore concepts on their own and extend them. There are several educators and groups that have created galleries with many such projects. However, the use of these galleries and projects in classrooms is very limited. In this panel discussion, we will identify and examine ways to help improve and promote the development and use of classroom-ready projects and galleries for math and science. We will share the experience of our informal international Super School group as a starting point. We will also examine the state of math and science galleries and projects and their usage.

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Getting Out

Looking for other fun activities to do while in Boston? Here are some of our favorites...

MIT Museum

<http://web.mit.edu/museum/>

Museum of Science

<http://www.mos.org/>

New England Aquarium

<http://www.neaq.org/>

Isabella Stewart Gardner Museum

<http://www.gardnermuseum.org/>

Museum of Fine Arts

<http://www.mfa.org/>

Blue Man Group

<http://www.bluman.com/tickets/boston/>

ImprovBoston

<http://www.improvboston.com/>

Tomb

<http://www.5-wits.com/>

Boston Duck Tour

<http://www.bostonducktours.com/>

Boston Harbor Cruises

<http://www.bostonharborcruises.com/>

The Freedom Trail

<http://www.thefreedomtrail.org/>

Fenway Park Tour

<http://mlb.mlb.com/bos/ballpark/tour.jsp>

Toscanini's Ice Cream

<http://www.tosci.com/>

And for getting around using Boston's great public transportation system...

Massachusetts Bay Transportation Authority

<http://www.mbta.com/>

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