Wednesday, July 25

12:00 Registration and Lunch

1:00 Pre-Conference Workshops

Each pre-conference workshop is three hours long (1pm to 4pm) and includes a bag lunch (12pm to 1pm). There are only 25 seats in each workshop; all of the workshops are now sold out.

Getting Started with Scratch
New to Scratch? Not sure how to get started? In this session, members of the MIT Scratch Team will introduce you to the big ideas behind Scratch and share stories of how it is being used across many settings. You will work on a hands-on activity to create your first Scratch project and share it on the Scratch website. You will also learn about resources for diving deeper into Scratch and strategies for helping others get started.

Getting to Know Scratch 2.0
Want to try out the next generation of Scratch? In this hands-on workshop, you'll get a chance to explore and experiment with the basic features of Scratch 2.0. Learn how to create and remix Scratch projects directly in the web browser, make your own programming blocks, share sprites between projects, and much more. Members of the MIT Scratch Team will discuss ideas underlying Scratch 2.0 and strategies for using it.

Camera, Motion, Action! A New Way to Interact with Scratch
With Scratch 2.0, you can use a webcam to sense motion and color in the world around you. Create interactive games, art, or musical projects that respond as you move your body. Trigger sounds as you walk through a scene. Herd cats with the wave of your hand! Join members of the MIT Scratch Team to experiment with these new camera features.

Physical-Digital Chain Reaction: WeDo and Scratch
Create a Rube Goldberg-style chain reaction, using Scratch, LEGO WeDo, rubber balls, duct-tape, and a variety of other playful materials. With the help of members of the MIT Scratch Team, you will learn to use Scratch to program motors and sensors in the LEGO WeDo robotics kit – then design links in a chain-reaction that connects the physical world and the digital world, as in http://www.youtube.com/watch?v=5mQRQ6vCAwE

Diving Deeper with Scratch 2.0
Scratch 2.0 adds a variety of advanced programming features, making possible new types of projects and connecting to important computer-science concepts. In this hands-on workshop, you'll learn how to use Scratch 2.0 to create procedures, add inputs to your procedures, explore recursion, spawn new sprites from within a script, and store variables and lists in the cloud.

4:00 End of Pre-Conference Workshops

Thursday, July 26

8:30 Registration and Continental Breakfast

9:30 Welcome and Keynote Session

Imagine, Program, Share: Five Years Later
Mitchel Resnick, Professor of Learning Research, MIT Media Lab
Karen Brennan, MIT Media Lab

10:30 Break

11:00 Concurrent Sessions

Event Space

Encouraging Girls to Become Creators
Patty Hicks

Getting Computer Science into the Curriculum
Joanne Barrett

Why Do I Have to Learn That? Scratching to Make Learning Relevant
Ryan Evans

Creative Thinking through Game Design and Multimedia
Barbara Manchee, Emily Natoli-Burns

Oh the Presentation Possibilities!
Janet Dee

Digital Augmented Stories with Scratch in Language Classes
Frank Sabaté

633

Saint Rose Alumni Scratching Intergenerational Teaching and Learning
Brandon Milonovich, Laurie Ellis, Stephen Costello, Helen Albanese

Changing the Culture of Learning: Making Thinking Visible
Jane Harris, Edwin Chiu, Winnie Wong, Felicia Tsang

525

My Excellent Vacation
Keith Braafladt, Peter Kirschmann

244

Smart Ears: Scratch and Spoken Language Development of Children with Hearing Loss
Pratibha Srinivasan

New Approach for Treatment of Game Addiction using Scratch
Soohwan Kim, SunGwan Han, Soojin Jun

493

Self-Organized Session

240

Self-Organized Session

12:00 Lunch

1:30 Concurrent Sessions

Event Space **Design-Based Learning, Computational Thinking, and the MIT Scratch Curriculum Guide**
Judy Hoffman, Melissa Nordmann, Russ Clough, Tyson Spraul, Karen Brennan

633 **Developing a Scratch Science Curriculum**
Brian Foley, Sergio Millan

Computational Thinking and Environmental Sustainability Education
Timothy Westbaker, Shaleen Jain, Michael Scott

525 **Adding to the Scratch Card Resources on the ScratchCard YouTube Channel**
Susan Ettenheim, Zachary Benedek, Alfred Heinemann, Kevin Li, Joey Lin, Chu Jun Liu, Wai Fun Ng, Kevin Zhong

244 **Update on the Integration of Scratch Programming as a Tool for Assessment in K-12 Curriculum**
Leslie Daniels

Fostering Students' Learning of Mathematics through Creative Computing
Umit Aslan

493 **Self-Organized Session**

240 **Self-Organized Session**

2:30 Break

3:00 Concurrent Sessions

Event Space **Scratch and Kinect Computer Camps: Best Practices and Future Developments**
Stephen Howell, Nobuko Kishi, Manabu Sugiura, Anders Berggren

633 **Getting to Know Scratch 2.0**
MIT Scratch Team

525 **Assessing Students' Computational Thinking in Scratch: A Workshop for Teachers**
Francisco Cervantes, Wendy Martin, Bill Tally, Mylo Lam, Aaron Morris

244 **Scratch as a Sandbox for Design Based Learning**
Svetlana Kasalovic

Improving Information Literacy Classes Using Scratch: A Quasi-Experimental Study
Angela Ramnarine-Rieks

493 **Self-Organized Session**

240 **Self-Organized Session**

4:00 Break

4:30 Posters and Demonstrations

6th Floor **Repentina: A Scratch Competition**
Nieves Garcia, Jorge Sigler

AprendiendoScratch
Juan Carlos Olabe, Xabier Basogain, M.A. Olabe, Inmaculada Maíz, Carlos Castaño

Catroid: A Visual Programming Language for Android
Wolfgang Slany

Scratch with Real Objects Using RFID
Frank Sabaté

NanoBoardAG: An Inexpensive Sensor Board Compatible with PicoBoard and WeDo
Kazuhiro Abe, Tomo Niimura, Koji Yokokawa, Kazunari Ito, Daisuke Kuramoto

Assignments, Assessments, and Rubrics, Oh My!
Rosemary Slattery

Computer Science in Motion: Scratch Projects for Elementary School Students
Christopher Michaud

Code Your World
Carlos Neves, Nádia Yuri Tomino

Snap! A Grownup Programming Language Based on Scratch
Brian Harvey

Wiki for Designing Scratch Games at Summer Camp
Evgeny Patarakin, Boris Yarmakhov, Vasiliy Burov, Yuriy Katkov

Scratch and the Curriculum of San Lorenzo's School: An Experience of Educational Innovation in Bolivia
Christopher Flores, Silvia Maldonado

Create Assistive Tools and Technology Aids with Scratch and Sensorboards
Alessandro Colombi

Library, Museum, and Community Collaboration with the Teen Tech Crew
Peter Kirschmann

World Museum: Design Principles for Cross-Cultural and Cross-Generational Collaboration
Yoshiro Miyata, Lorraine Leo

Can You Create a Game: Using Games for Student Evaluation of Math Content
Leanna Prater, Joan Mazur

Learning to Program through Physical Actions using Scratch and Kinect
Nobuko Kishi, Manabu Sugiura, Kazuhiro Abe, Daisuke Kuramoto, Stephen Howell

Don't Let Your Scratch Days Become Long Nights: Planning, Organizing, and Executing Successful Scratch Days
Michael Tempel, Cameron Fadjo, Jason McDonald, Jane Moore, Tracy Rudzitis

ScratchJr: Learning in Early Childhood through Programming
Louise Flannery, Elizabeth Kazakoff, Paula Bontá, Brian Silverman, Marina Bers, Mitch Resnick

It's a Small, Scratch World: An International Scratch Club between Mexico and the United States
Amanda Davies, Will Davies, Henry Davies, Santiago Perez-Verdia

Educational Contents for the Students, by the Students
Masahiro Yachi, Seijiro Ota, Masako Sasaki, Chika Kokita, Kentaro Oe, Yuki Ono

Improving Spatial Perception Using Expanded Scratch Sensor Board
Seungyeop Han, SunGwan Han, Chulhyun Lee

Build It! Little Crab Game Workshop
Daniel Green, Rich White

Meet Mechgellan: The Scratch Talking Robot
Gabriel Ward, Danielle Martin

Scratch, WeDo, and Picoboards: Educational Robotics in Uruguay
Jose Miguel Garcia

6:00 Dinner Excursions
Want to continue the conversation? Join other participants on a trip to a local restaurant. Sign up at the Information Desk to join one of the dinner excursion groups.

Friday, July 27

8:30 Registration and Continental Breakfast

9:30 Keynote Session

Participation in Computational Culture
Connie Yowell, Director of Education for U.S. Programs, MacArthur Foundation
Jan Cuny, Program Officer, National Science Foundation
Moderated by Mitchel Resnick, Professor of Learning Research, MIT Media Lab

10:30 Break

11:00 Concurrent Sessions

Event Space

The Earlier, The Better: Kindergarten-Aged Kids Creating their World with Scratch
Vera De Leon

Ten Things I Learned from Creating an After-School Scratch Club
PK Shiu

The World of the Autism Spectrum and Students who Love to Scratch
Vicki Gold

Scratch Chaos in a Middle School
Joseph Jones

The Windows and Doors of Scratch
Sandie Bleecker

Unleashing Logic: The Path to a New Way of Thinking
Colin Meltzer, Jennifer Junkin

633

Five Spanish Schools, Five Different Approaches
Teresa Ferrer

TIC TAC Project: Creativity as a Driver of Human Development
Eduard Muntaner-Perich, Jordi Freixenet

525

Sensing Our World
Margaret Low, Philip How, John Rendall, Marie Low

244

Scratch Israel: Sowing Offline and Online Seeds for a Local Scratch Community
Oren Zuckerman, Orad Weisberg

493

Self-Organized Session

240

Self-Organized Session

12:00 Lunch

1:30 Concurrent Sessions

Event Space **Designing Scratch 2.0**
John Maloney, Brian Silverman, Paula Bontá, Natalie Rusk, Mitch Resnick

633 **AutiSTEM: Using Scratch to Explore Computational Thinking through Game Design and Robotics for Students with Autism**
Rayshun Dorsey, Ayanna Howard

Bring Young Imaginations to Life: Using Scratch with 1st and 2nd Graders
Ingrid Gustafson

525 **Getting into the Digital Music Game With Scratch**
Jesse Heines, Gena Greher

244 **Attaining Government Recognition for a Scratch Outreach Program: Our Building Blocks Described**
Clare McInerney, Stephen Howell

Teacher Training in Uruguay
Inés Kereki

493 **Self-Organized Session**

240 **Self-Organized Session**

2:30 Break

3:00 Concurrent Sessions

Event Space **The Use of Scratch and its Impact in OLPC Learning Communities**
Claudia Urrea, Sandra Barragan, Pedro Cuellar, Martin Perez, Carolina Garcia

633 **For the Win: Middle-Schoolers' Use of Scratch for the National STEM Video Game Challenge**
Quinn Burke, Yasmin Kafai, Chad Mote

Worksheets for "Small Videogame" Design and Development in Scratch
Rafael Fajardo, Scott Leutenegger

525 **Getting to Know Scratch 2.0**
MIT Scratch Team

244 **Early Introduction of Programming Paradigms and Programming Language Vocabulary using Scratch**
Matthew Meyer

The "Beauty and Joy of Computing" Curriculum and the AP CS: Principles Project
Brian Harvey

493 **Self-Organized Session**

240 **Self-Organized Session**

4:00 Break

4:30 Special Interest Group Meetings
Get together with others to discuss a topic of shared interest. Discussions will take place on the sixth floor and the topic at each table will be declared by signs.

6:00 Reception
Join us at the MIT Museum (265 Massachusetts Avenue, Cambridge) from 6pm to 8pm for the conference reception, which includes appetizers and a cash bar. You will receive a reception ticket (and any additional purchased tickets) when you check in to the conference. Your reception ticket entitles you to one free drink. A map and directions are included at the back of this program.

8:00 End of Reception

Saturday, July 28

8:30 Registration and Continental Breakfast

9:30 Keynote Session

Scratch Goes to School
Judy Barbera, Assistant Superintendent for Instruction
Sandra Reyes, Elementary STEM Coordinator
David Grammerstorf, 3rd Grade Teacher
Nicole Hovsepian, 3rd Grade Teacher
Andrea Edwards, Instructional Facilitator
Genna Colonnato, 3rd Grade Student
Jacob Goodman, 3rd Grade Student
Jason Kardon, 3rd Grade Student
Sarah Katz, 3rd Grade Student
Joe Ligresti, 3rd Grade Student
Moderated by Karen Brennan, MIT Media Lab

10:30 Break

11:00 Concurrent Sessions

Event Space **Scratcher Show and Tell**
Hosted by Karen Brennan, Aaron Morris, Mylo Lam

633 **Injecting Computational Thinking into Computing Activities for Middle School Girls**
Heidi Webb

Speaking the Language: Teaching Code Literacy in the Middle School Classroom
Cameron Fadjo, John Black

525 **Creating World Museum: Expanding Our Passions**
Yoshiro Miyata, Nobuyuki Ueda, Yasushi Harada, Manabu Sugiura, Tomohiro Ueshiba, Tomoyuki Sowa, Lorraine Leo

244 **Making Together: Supporting Creative Collaboration in Scratch**
Yasmin Kafai, Debbie Fields, Quinn Burke, Ricarose Roque, Amos Blanton

493 **Self-Organized Session**

240 **Self-Organized Session**

12:00 Lunch and Closing Keynote

1:30 End of Conference

Thursday Keynote

Imagine, Program, Share: Five Years Later
Mitchel Resnick, Professor of Learning Research, MIT Media Lab
Karen Brennan, MIT Media Lab

The world of Scratch has grown significantly since the authoring environment and online community were launched five years ago. Mitchel Resnick and Karen Brennan of the MIT Scratch Team open the conference with a conversation about the evolution of the Scratch community, and about their hopes for the conference.

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.

Karen Brennan is a PhD student in the Lifelong Kindergarten group at the MIT Media Lab. Starting in November, she will be an Assistant Professor at Harvard University in the Graduate School of Education. Her research is primarily concerned with the ways in which learning communities support computational creators, both in and out of school, and she leads the ScratchEd project.

Concurrent Sessions, Thursday 11:00-12:00

Event Space

Encouraging Girls to Become Creators
Patty Hicks
How can we encourage girls to become creators as well as users of computer technologies? At Gregory Middle School, computer programming is part of the curriculum as a required course. The lessons involve audio, music, storytelling, and video gaming to make it more interesting to all students. Programming in Scratch is a natural way to encourage the 4C's that our district is looking for: Communication, Collaboration, Creativity and Critical-thinking. Students are encouraged to take risks and become comfortable with failing and we have found that students who never make a mistake don't learn as much as the students who make mistakes and then fix them – especially if they fix them in collaboration with their peers. In eighth grade, we build a bridge to high school and the subsequent transition to Visual Basic and Java by including more logical and conditional operators. This presentation will discuss the Scratch programming class curriculum and course elements.

Getting Computer Science into the Curriculum
Joanne Barrett
STEM has brought us changes in curriculum and education policy. Unfortunately, just where computer science fits into STEM is unclear. As the need for computer scientists grows in our society, many U.S. states' K-12 systems are reducing students' access to computer science. This session will look at the journey to get computer science into the curriculum. Specifically, Scratch is a great program to help open doors and introduce students to computer science, and in turn, get their parents excited about the possibility of learning programming. Scratch was used at a community outreach program where fourth and fifth grade girls spent time coding during the program and in their free time.

Why Do I Have to Learn That? Scratching to Make Learning Relevant
Ryan Evans
Relevant learning is critical for the 21st century student. Scratch adds relevancy because it can be integrated into all subjects. It's critical for students to know how to utilize technology beyond the classroom. It's equally essential for students to recognize what can be done with information learned in other classes and why certain concepts are significant beyond their primary subject area. Attendees of this presentation will be provided with a demonstration of Scratch projects created in my technology classes that found their origins in the classrooms of other subjects. I'll share the tools used to initiate, facilitate, and assess student work. I will also review the significance of uploading projects to the Scratch website, where students are afforded immediate gratification as well as an avenue and forum for further discussion.

Creative Thinking through Game Design and Multimedia
Barbara Manchee, Emily Natoli-Burns
Through the Pittsford Central Schools Summer Enrichment Institute 2011, students in grades six through ten were offered a class titled, “Creative Thinking Through Game Design and Multimedia.” The class description read, “Would you like to design your own game, create your own animation and multimedia project? Using an easy programming language developed by MIT, you can learn about game design, programming, creative thinking and you can have fun!” Our goal was for students to understand that games are made with programming languages. Our objectives stated that students would be introduced to fundamental ideas about programming and create their own Scratch projects. This session will detail the three-day agenda of the course, resources and strategies used, steps taken, successes and struggles.

Oh the Presentation Possibilities!
Janet Dee
Scratch is definitely a programming language, but it is so much more. With Scratch, students can make multimedia, interactive presentations that are sure to wow their audiences. Instead of a slide deck of linear content or a series of zooming text boxes, the Scratch platform gets students to reflect on their topics and truly personalize their message. What student wouldn’t enjoy adding speech, motion, and music to their original sprite creations? Come see how my high school students used avatars, original costume designs and costume changes, as well as many other scripts to create Scratch programs that expressed their world. See designs of their study spaces, mazes for sharing their accomplishments, and stories of their freshman year goals. With a few Scratch Curriculum Guide lessons and a lot of sharing, students can craft unique presentations (more like performances) that readily show they have mastered both the content and the tool.

Digital Augmented Stories with Scratch in Language Classes
Frank Sabaté
This is the second year that fifth grade students at Escola Projecte in Barcelona designed Digital Augmented Stories in their language classes. A Digital Augmented Story is a story that happens both in the virtual world and in the real world. Students write their stories and then program them in Scratch. Stories need to receive input from sensors (sound, light, inclination) to reach an end or perform actions in the real world via motors. Using the LEGO WeDo Robotics Kit, microphones, and the PicoBoard, ten-year-old students design their stories during eight of their Spanish or Catalan language sessions. In this way, we can introduce Scratch into the official curriculum while also getting language teachers involved in using technology to foster creative thinking.

633 Saint Rose Alumni Scratching Intergenerational Teaching and Learning

Brandon Milonovich, Laurie Ellis, Stephen Costello, Helen Albanese

Scratch provides students with an environment where creativity and learning meld into one. Using Scratch, students are able to interact with curricula through a new lens and reflect on their newly developed critical thinking skills. In particular, they learn and explore in ways that are meaningful to them. Three College of Saint Rose alumni along with three pre-service teachers worked in conjunction with a College of Saint Rose professor of Computer Science to give students such an environment. Originally a pilot study conducted in 2010, Scratch has spread and inspired kids throughout nearby schools. Through blended learning of in-school courses, after-school sessions and workshop times, Scratch has been adopted in an urban setting as a motivational tool and an effective mode of learning. Results from this pilot study have led to the inclusion of Scratch in two college courses for pre-service teachers, a published paper regarding Scratch, several professional development opportunities across New York State, a website displaying student work, as well as a blended learning pilot.

Changing the Culture of Learning: Making Thinking Visible

Jane Harris, Edwin Chiu, Winnie Wong, Felicia Tsang

During this panel discussion, three teachers will present a collaborative project between an international school and a local school in Hong Kong. The presenters will share how the partnership was prepared and implemented, and they will consider whether the project has made an impact on the culture of learning in our respective schools or has challenged assumptions about what learners are capable of. The project was supported by LEAD Creative Class (Learning through Engineering, Art & Design) and Apple Inc., with funding from The Hung Hing Ying and Leung Hau Ling Charitable Foundation.

525 My Excellent Vacation

Keith Braafladt, Peter Kirschmann

My Excellent Vacation was developed from work with teens that focused on media production, storytelling, media literacy and the importance of creating local, place-based stories. This project is based on team-building activities around community-mapping. It focuses on a place that was personally meaningful, a place celebrated in a particular community or even a vacation trip. For this one-hour workshop, each participant will brainstorm their most important place or vacation and create a Scratch project around their chosen site or trip. Once they've created their Scratch project they will then build a mash-up by connecting this project to a publicly shared map using Google Maps.

244 Smart Ears: Scratch and Spoken Language Development of Children with Hearing Loss
Pratibha Srinivasan
This session will describe how children who have a hearing loss have used Scratch to help build their listening, comprehension, and speaking skills. The connection between language learning and the Scratch programming language will be discussed and a model for using Scratch for children with hearing loss will be presented. The model connects specific blocks in the Scratch interface with learning syntax, semantics, and pragmatics and puts the blocks in a hierarchy that matches the sequence of language development. Brief video clips will demonstrate lessons using Scratch with children who have varying language skills.

New Approach for Treatment of Game Addiction using Scratch
Soohwan Kim, SunGwan Han, Soojin Jun
This presentation shares research conducted by The Institute of Future Informational Talent (I-FIT) to assess the effectiveness of implementing the Creative Computing curriculum guide in Korea. This research will be the first case of evaluating usage of the curriculum in Korea. The goal of these studies is to develop and employ a new curriculum based on the Creative Computing guide that allows elementary students to use their ideas to create programs and not just teach them how to use the computer. This presentation will also share previous related studies that have proven Scratch education as a useful method for improving higher thinking and problem-solving capabilities and discuss suggestions for future work.

493 Self-Organized Session

240 Self-Organized Session

Concurrent Sessions, Thursday 1:30-2:30

Event Space **Design-Based Learning, Computational Thinking, and the MIT Scratch Curriculum Guide**
Judy Hoffman, Melissa Nordmann, Russ Clough, Tyson Spraul, Karen Brennan
With funding from Google and the NSF, we have been developing a Scratch curriculum guide. A draft of the guide was released in September 2011, and since then, it has been downloaded more than 30,000 times and translated into several languages (including Portuguese, Spanish, Turkish, and Korean) by Scratch educators from around the world. In addition to collecting feedback about the guide via ScratchEd, we have been conducting a year-long pilot with 10 schools to understand guide use. In this session, four members of the pilot study will share their experiences of working with the guide in their classroom.

633 **Developing a Scratch Science Curriculum**
Brian Foley, Sergio Millan
The Scratch Science Project is an effort to have students use Scratch to create models of real-world action to test their ideas and develop computational thinking. Our effort is to have students creating physics-based games (similar to Angry Birds) as a way to help students understand laws of motion. Creating games encourages students to use their ideas about motion to try and make the game action look realistic. We report on an experimental summer school class where students created games with Scratch and refined them by comparing behavior to real-world objects. More recent efforts look to turning these activities into lessons appropriate for school science classes and initial results of this work will be presented.

Computational Thinking and Environmental Sustainability Education
Timothy Westbaker, Shaleen Jain, Michael Scott
Environmental sustainability rests on a holistic understanding of the interconnected human and natural systems. Watershed education in middle school curriculum provides a unique opportunity to explore creative learning and problem solving. We will share our ongoing efforts to test and implement an integrated program in the Montessori school setting, wherein the use of Scratch seeks to increase student interest and support multi-faceted learning. During the initial phase of this project, a primary focus has been one of developing an understanding of: a. computational learning concepts, b. programming fundamentals (logical and decision blocks etc.), c. appropriate use of art and sounds within the rich programmable media environment, and d. simple to complex watershed sustainability questions, wherein individual and team-based learning can be facilitated. Through a number of cases studies involving watershed sustainability issues, the university student-led team worked closely with faculty to implement a pilot program with a group of nine Montessori school students.

525 Adding to the Scratch Card Resources on the ScratchCard YouTube Channel
Susan Ettenheim, Zachary Benedek, Alfred Heinemann, Kevin Li, Joey Lin, Chu Jun Liu, Wai Fun Ng, Kevin Zhong
Inspired by the development of Scratch Resources, we started making our own Scratch Cards and invite you to join us and add to this very rich resource! We are thrilled to invite you to join us at the new YouTube channel, ScratchCardResources. Scratch Card Resources is a place to share custom-made Scratch Cards. Each project has a video that shows what is being taught with a link to the printable Scratch Card. We want to invite others to submit a card to this channel. Come hear about our process, give us feedback, and share your ideas!

244 Update on the Integration of Scratch Programming as a Tool for Assessment in K-12 Curriculum
Leslie Daniels
As an update after launching this idea at the 2010 Scratch@MIT event, this presentation will review the successes achieved and challenges that remain with the integration of Scratch programming as an assessment tool in K-12 curriculum. A description of its implementation in an eighth grade physical science curriculum will be presented, noting the growth and development observed. These successes will be contrasted with the challenges presented by the emerging focus on teacher pay for performance initiatives mandated with the receipt of federal monies to support education and the resultant trend towards all teachers teaching the same content, the same way, each day. The focus on assessment throughout the year and the lack of computer access further compound the problem. Though some school districts have recoiled at efforts to infuse technology, others fortunately, continue to provide support. With the current focus on teacher performance review, the import of administrative support to promote teacher buy-in to infusing technology such as Scratch into the K-12 curriculum will be discussed.

Fostering Students' Learning of Mathematics through Creative Computing
Umit Aslan
There are many studies on the effects of using Scratch and other visual programming tools (Stagecast Creator, Toontalk, etc.) on students' motivation and interest in school courses such as mathematics, history, or music. On the other hand, it is hard to find studies concentrating on meaningful learning of content knowledge through such activities. In a research project in Turkey, sixth through eighth grade primary school students attended Scratch lessons once a week for ten weeks and developed games on probability. The change in students' anxiety levels towards mathematics was measured by comparing answers to the Mathematics Anxiety Scale before and after the project. Moreover, the change in students' learning of probability was measured by comparing their pre-test and post-test scores on the Performance Test on Probability Problems. In this presentation, findings of this study will be shared by showing statistical evidence. Also, observations and examples from mathematics games developed by students will be shared.

493 Self-Organized Session

240 Self-Organized Session

Concurrent Sessions, Thursday 3:00-4:00

Event Space **Scratch and Kinect Computer Camps: Best Practices and Future Developments**
Stephen Howell, Nobuko Kishi, Manabu Sugiura, Anders Berggren
The addition of the Kinect controller to the Scratch programming toolbox has led to a number of interesting workshops in Sweden, Japan, Spain, America, and Ireland, to name a few. This panel consists of the developer of the Kinect2Scratch software, researchers and lecturers from Japan who have used the software extensively in real-world environments, and a Swedish ICT in Education expert who was a beta tester on the Kinect2Scratch software. This panel will discuss best practices for introducing the Kinect to programmers already familiar with Scratch, how much Scratch to teach before introducing the Kinect, and what activities are most suitable for this combination. Some student-generated projects will be discussed. Particular emphasis will be given to the most common Kinect2Scratch usage – making motion-controlled games. Additionally, there will be a discussion of what features could and should be added to future versions of Kinect2Scratch. This panel is an opportunity for other community members who may have used the Kinect with Scratch but have not publicized their experiences to give valuable feedback to the developer, as well as allow the developer to show some evolving concepts such as gesture recognition, voice control, 3D skeletal tracking, user recognition, and user tracking.

633 **Getting to Know Scratch 2.0**
MIT Scratch Team
Want to try out the next generation of Scratch? In this hands-on workshop, you'll learn how Scratch 2.0 can open new opportunities for creativity and collaboration. You'll get a chance to explore some of the new features of Scratch 2.0: make your own programming blocks (procedures), share sprites and scripts between projects, use a webcam to sense movements in the world, and more. Members of the MIT Scratch Team will discuss ideas underlying Scratch 2.0 and strategies for using it.

525 **Assessing Students' Computational Thinking in Scratch: A Workshop for Teachers**
Francisco Cervantes, Wendy Martin, Bill Tally, Mylo Lam, Aaron Morris
Researchers from Education Development Center (EDC) have been working with the ScratchEd Team, teachers, and student Scratchers to develop rubrics and procedures for assessing students' computational thinking (CT) in Scratch. The assessments have three components: short, standardized debugging tasks, created by the Scratch Team and keyed to the Scratch Curriculum Guide; a rubric with performance codes that correspond to the Scratch computational thinking framework of CT Concepts, Practices and Perspectives; and software tools for managing and coding records of student work. This session will present an overview of our draft CT Assessment Tool and offer participants a chance to apply it to videos of student work. We will invite discussion about the framework's strengths and weaknesses in capturing important elements of students' competency with Scratch, and gather suggestions for making the assessments usable and practical for teachers at the upper elementary, middle and high school levels. Interested teachers will be encouraged to help us pilot the CT assessment tools during the 2012-2013 academic year.

244 Scratch as a Sandbox for Design Based Learning

Svetlana Kasalovic

This presentation explores Scratch as a sandbox for Design Based Learning. The Design Based Learning method engages students in the creative process of building and virtually modeling artifacts representing different aspects of the curriculum. This approach reverses the learning process and starts with invention. This spring, Design and Society students at Moorpark College explored the process of digital fabrication of their artifacts using Scratch. This decision was rooted in the benefits of online accessibility of Scratch, as well as the broader scope of the tools and technologies, including animation and scripting. Another relevant factor is the design based learning nature of Scratch and the support of the online community. This presentation will inform the Scratch community about experiences with Scratch as a sandbox for design based learning and invite the audience to discuss the effectiveness of Scratch as a sandbox for design based learning at the college and university level.

Improving Information Literacy Classes Using Scratch: A Quasi-Experimental Study

Angela Ramnarine-Rieks

The primary purpose of this quasi-experimental pre and post-test study is to examine whether the use of game design will have an impact on content learning, understanding, and retention of knowledge in information literacy classes. Information literacy (IL) is considered critical in a growing number of social and academic contexts. Despite the importance of IL, many learners still have little idea how to evaluate information for relevance, accuracy, or authority and are generally uncritical about messages offered to them through online media. The discourse on the use of games as a platform for library orientations and instruction is increasingly being addressed in the practitioner-oriented literature. This study has the potential of creating new knowledge about game design specific to higher education and libraries. The sample for this study is a non-probability convenience sample of undergraduate students. Findings show that despite brief exposure to Scratch, students were able to successfully design functional games using various game design characteristics.

493 Self-Organized Session

240 Self-Organized Session

Friday Keynote

Participation in Computational Culture
Connie Yowell, Director of Education for U.S. Programs, MacArthur Foundation
Jan Cuny, Program Officer, National Science Foundation
Moderated by Mitchel Resnick, Professor of Learning Research, MIT Media Lab

How can young people become full participants in today's (and tomorrow's) society? What knowledge, skills, capacities, and dispositions do they need? How are digital media and computation changing what young people need to know and the ways they participate? In this session, Jan Cuny and Connie Yowell discuss how they explore these questions in their work – and how educators can support young people's participation in computational culture.

Connie Yowell is the Director of Education for U.S. Programs at the MacArthur Foundation, where she oversees an $85 million program on Digital Media and Learning, one of the first philanthropic efforts in the country to systematically explore the impact of digital media on young people and implications for the future of learning.

Prior to joining the MacArthur Foundation, Yowell was an Associate Professor at the University of Illinois, publishing scholarly work that examined the complex interplay among young people's emerging identity, their social context, and achievement. Her research integrated the fields of adolescent psychological development and organization change to address the problem of high school dropout among immigrant students in the United States. Yowell briefly served as Policy Analyst in the U.S. Department of Education during the Clinton Administration, and has worked closely with teachers and administrators to develop and implement literacy curricula for Latino youth, and as evaluator and program coordinator for youth development programs in New York City.

Yowell received the Distinguished Fellows Award from the William T. Grant Foundation, an award to support scholars seeking to bridge research and practice, under which she worked with the National Writing Project to develop approaches that integrate web 2.0 technologies into the social practices of teachers. Yowell earned her bachelor's degree from Yale, and her PhD from Stanford University.

Jan Cuny is a Program Officer at the National Science Foundation, where she leads the Computing Education for the 21st Century (CE21) program and the Broadening Participation in Computing Alliance (BPC-A) program. Before coming to NSF in 2004, Cuny was a faculty member in the Computer Science departments at Purdue University, the University of Massachusetts, and the University of Oregon. Her research centered on programming environments for computational science.

The National Science Foundation's BPC-A and CE21 programs aim to build a robust computing research community, a computationally competent 21st century workforce, and a computationally empowered citizenry. The CE21 program supports initiatives to increase the number and diversity of K-14 students and teachers who develop and practice computational competencies. The BPC-A program supports large collaborations of universities and organizations aimed at increasing the number of graduates in the computing and computationally-intensive disciplines, with an emphasis on the inclusion of students from underrepresented groups.

Cuny has been involved in efforts to increase the participation of women in computing research for many years. Before joining NSF, she was a long-time member of the Computing Research Association (CRA) Committee on the Status of Women, a member of the Advisory Board for Anita Borg Institute for Woman and Technology, the Leadership team of the National Center for Women in Technology, the Executive Committee of the Coalition to Diversify Computing, and the Board of Directors of the Computing Research Association. For her efforts with under-represented populations, Cuny received an ACM President's Award in 2006, the A. Nico Habermann Award from the CRA in 2007, and the 2009 Anita Borg Institute's Woman of Vision Award for Social Impact.

Concurrent Sessions, Friday 11:00-12:00

Event Space

The Earlier, The Better: Kindergarten-Aged Kids Creating their World with Scratch
Vera De Leon
Scratch is used worldwide, and most recently in Mexico, not only as a very important educational strategy to promote the participation of all educational levels in programming and robotics activities but also as a tool to strengthen students' confidence levels to succeed in life. During 2007, TELMEX made the Casa TELMEX (TELMEX House) project, with the firm conviction that education is an essential component of a free, healthy, just, and prosperous society, and that by providing children and youth of today the possibility of acquiring useful skills, they will increase their chances of improving their conditions and quality of life in the short and long term. Casa TELMEX is an ambitious project where the primary objective is to contribute actively in the development of digital literacy resources, providing educational technologies to students from age four to eighteen, giving support to teachers and parents, and building together informal learning scenarios that complement education in schools. Join us and find out how programming with Scratch and robotics at an early age helps kindergarten-aged children to explore and discover important skills for learning and socializing.

Ten Things I Learned from Creating an After-School Scratch Club
PK Shiu
I am a parent of two elementary children at a K-6 private school in Boston, MA. Two years ago, I decided to introduce more technology focus and use in the school. I settled on starting an after-school Scratch club amongst other after-school offerings at the school. In the spirit of project-based learning, I had no idea what I had gotten myself into until the club began. Running a mixed-age, after-school program is quite different from using Scratch in a classroom during regular school hours. After two years of running the club, I have learned a few things, ranging from administrative issues to curriculum design, from classroom management to parent management. In this presentation, I will share ten things I have learned. Others thinking about starting a Scratch club may find this particularly useful.

The World of the Autism Spectrum and Students who Love to Scratch
Vicki Gold
I work with students of all ages and on all levels of the autism spectrum. I work a great deal with the autistic community. Within the Scratch world, there is a growing community of autistic Scratchers whose expertise range from the high levels to the low levels of the spectrum, and each student has fun making and creating what they enjoy producing and understanding. These students do not necessarily identify themselves as special because they feel there is no need. In Scratch, students are equal, no reason to boast or advertise unless for personal reasons. I will present examples of these students' work and share interviews with these students demonstrating their remarkable attitudes toward the world of Scratch. I will discuss how the autistic community has found Scratch to be a participatory community that is safe, that accepts them on an equal basis, and at times embraces them.

Scratch Chaos in a Middle School
Joseph Jones
What happens when you allow the kids to tell you what to do with the class? In a middle school in South Jersey we attempted to see what would happen if we did just that with our eighth grade technology classes. We found that the students are sometimes better at deciding what they need than their teachers. Can we let our users be our directors? Are the students able to work with information on an as-needed basis? This is the story of one public middle school in the hinterland of south New Jersey attempting to see if this can work.

The Windows and Doors of Scratch
Sandie Bleecker
Windows and doors are parts of a building – a structure that can have a “low floor,” “high ceiling”, and “wide walls”, characteristics of Scratch highlighted by Mitch Resnick and the MIT Scratch Team. Years ago, Seymour Papert and others spoke of “windows” into children’s thinking as they learned and used Logo. With its graphical interface, Scratch opens doors to a wider world of possibilities, accessible to users of varying abilities. The Learning Center for the Deaf piloted a Scratch project, funded by the Boston Scientific Foundation. Three teachers learned Scratch and ran an after-school program in Spring 2011 for students in grades 4-6; one teacher continued to use Scratch in middle school. In Spring 2012, twenty faculty participated in a Scratch course offered school-wide. Our Scratchers were a diverse group: deaf students, elementary and middle school, some on the autism spectrum; assistants and teachers, hearing and deaf, elementary through high school, in all content areas. The view through that window into someone’s thinking, whether adult or child, is amazing. To look out the door into new worlds that people create with Scratch, not in a single program, but as a progression over time, is an unpredictable unfolding, equally amazing.

Unleashing Logic: The Path to a New Way of Thinking
Colin Meltzer, Jennifer Junkin
Interested in learning more about the benefits of Scratch? In this session, we will explore how Scratch can be used successfully in a school setting. Specifically, we will focus on the connection between programming and logical reasoning skills with different types of learners. To illustrate this relationship, we will share the story of students’ and educators’ experiences with Scratch. Ultimately, the students learned many valuable skills, not just programming, but how to think in a sequential and creative way. Our experiences have shown us that Scratch is a golden opportunity to help both students and teachers change the way they learn and instruct.

633 Five Spanish Schools, Five Different Approaches

Teresa Ferrer

This presentation will share experiences from the Spanish ScratchEd community, profiling five different Spanish schools currently working with Scratch. The pedagogical approaches and educational philosophies of these schools are quite different, giving a wide vision of promising Scratch applications, both at a lower and upper educational level. Although the majority of the schools have been working with Scratch during the last three to four years, many more are starting to become interested in this programming language. The Catalan Department of Education offers online Scratch seminars for teachers and hosts Scratch Day events. Interest in Scratch is also increasing within the teacher community, mainly because more professionals are sharing their findings and excitement with colleagues and “recruiting” new users.

TIC TAC Project: Creativity as a Driver of Human Development

Eduard Muntaner-Perich, Jordi Freixenet

TIC TAC is a Development Cooperation project of the University of Girona (Spain) focused on helping two elementary schools in Catalonia. These two schools, in the cities of Girona and Salt, have very high immigration rates (> 85%) and are in danger of becoming “ghetto schools”. Currently, these two schools regularly visit our spaces in the Science and Technology Park of University of Girona, where they actively participate in several workshops and activities designed by our team. A very significant part of these activities includes children using Scratch to learn to express themselves creatively through technology. As the students progress, they participate in workshops using LEGO robotics, underwater robots, rescue robots, astronomy, artificial intelligence, and technological gymkhanas in the city. This initiative has evolved from an outreach project to a research project, where studies and evaluations of how these technologies help develop creative thinking and critical thinking have developed. In this session, preliminary research findings will be presented with particular emphasis on the Scratch workshops carried out with three groups of fifth graders in each of the two schools.

525 Sensing Our World

Margaret Low, Philip How, John Rendall, Marie Low

This workshop gives participants the opportunity to build and calibrate sensors that enhance the existing capabilities of the Scratch Sensor Board. Workshop participants will select a sensor to build and calibrate. Presenters will introduce some sample applications to demonstrate their use and encourage participants to develop their own applications. In the workshop, we will explore ideas for additional sensors and applications. For example, we will see how to build a simple tilt sensor, create a ‘lunchbox alarm’, make a simple pressure sensor, build a quiz response game, create a bottle cap drum set, and count things using the light sensor.

244 Scratch Israel: Sowing Offline and Online Seeds for a Local Scratch Community
Oren Zuckerman, Orad Weisberg
This session will present the Scratch Israel mentors team and their extensive work this year on growing a local Scratch community in Israel. The mentors' work includes a year-long workshop in a local school, several one-time introductory workshops with a range of student populations at various places in Israel, and extensive online activity on Facebook, YouTube, an educators' site, and Twitter. The presentation will start with a general overview of the mentors' work and continue with an in-depth review of the year-long workshop, including specific examples of the curriculum developed, the children's challenges, the online strategy and materials, and the current challenges in building the local Scratch community bottom-up.

493 Self-Organized Session

240 Self-Organized Session

Concurrent Sessions, Friday 1:30-2:30

Event Space **Designing Scratch 2.0**
John Maloney, Brian Silverman, Paula Bontá, Natalie Rusk, Mitch Resnick
During the past three years, the MIT Scratch Team has been working on a new generation of Scratch, called Scratch 2.0. We recognized, from the start, that there were many different ways that we could extend and enhance Scratch. Should the new version focus more on the needs of expert Scratchers or novices? Should it include more computer-science features or more opportunities for creative expression or more possibilities for collaboration? Should it put more emphasis on making it easy for children to create or on expanding opportunities for children to learn? Of course, it would be easy to say "all of the above," but the design process involves tradeoffs and choices. In this panel discussion, members of the MIT Scratch Team will describe the process of designing Scratch 2.0, the principles that are guiding the design process, the role of suggestions from the community, the most challenging decisions, and new insights that are emerging from the process. Come hear about the thinking, arguing, passion, and joy that is going into the design of Scratch 2.0.

633 **AutiSTEM: Using Scratch to Explore Computational Thinking through Game Design and Robotics for Students with Autism**
Rayshun Dorsey, Ayanna Howard
In this presentation, we will discuss the usage of Scratch to successfully engage children with autism using interactive learning scenarios, while still maintaining the benefits found in traditional therapeutic playing scenarios. The presentation will elaborate on the use of alternative interface modalities to engage students with mild to moderate Autism Spectrum Disorders (ASD) through Project Based Learning Instruction (PBLI) using Scratch-based activities. The presentation focuses on how Scratch can be used to engage students in hands-on STEM based learning activities that support the ability to learn to think creatively, reason systematically, enhance social skills, and experience teamwork. We discuss how using interactive learning scenarios and object-oriented concepts such as the creation of simple video games, virtual world 3-D stories, and building and controlling robots using Scratch can be useful tools in enhancing the social skills of students from the mild to moderate spectrum of autism.

Bring Young Imaginations to Life: Using Scratch with 1st and 2nd Graders
Ingrid Gustafson
How do you provide young Scratchers with the tools to become independent and creative programmers? This presentation is based on experiences teaching a semester-long Scratch curriculum to first and second grade students, seeing young Scratchers' projects, hearing their voices, and learning from mistakes. See how even the youngest students in school can be exposed to programming concepts and assessed using tools built into Scratch that are appropriate for their age level. After a brief overview of the curriculum, hear how first and second graders from Cambridge Public Schools used Scratch, what their favorite tools and projects are, and how it helped them to express themselves in unique ways.

525 Getting into the Digital Music Game With Scratch

Jesse Heines, Gena Greher

Professor Dan Trueman, cofounder of the Princeton Laptop Orchestra has said, “There is nothing like making music and messing with sound to inspire people to learn how to program.” This workshop introduces participants to Scratch’s music-generating capabilities and shows how they can be used to teach computing concepts to students with a wide range of music and computing experience. The workshop demonstrates techniques used in “Sound Thinking,” a university General Education (GenEd) course open to all students in all majors. Participants will receive an extensive handout with links to our teaching materials, and they will have the opportunity to create music-generating programs themselves using a variety of Scratch constructs. The workshop will conclude with a mini concert in which some participants will play the music that they created. Although our experience is based primarily on a university-level course, we have used some of the techniques we’ve developed with middle and secondary school students in after-school programs. This workshop is therefore appropriate for teachers at all levels, including those with little or no music or computing experience and those who are just beginning to work with Scratch.

244 Attaining Government Recognition for a Scratch Outreach Program: Our Building Blocks Described

Clare McInerney, Stephen Howell

A Scratch outreach program has been running in Ireland since 2008. Our work has recently been acknowledged, recognized and regarded as successful by the government through a high profile government publication, a national ICT Action Plan. We have also started planning and organizing teacher training in collaboration with the National Centre for Technology in Education (NCTE). NCTE provides courses and other continuing professional development (CPD) opportunities to support the integration of ICT in the curriculum and to develop e-learning in schools. NCTE has a network of 21 education centers around the country through which it delivers teacher training. This presentation will describe the building blocks of the outreach program, teaching materials, Scratch competition, teacher training and summer computing camps, the challenges we have encountered, and our future plans.

Teacher Training in Uruguay
Inés Kereki
Uruguay is a small South American country with 3.3 million inhabitants. In 2007, the government launched the CEIBAL plan (www.ceibal.org.uy), a program based on the ideas of the project "One Laptop per Child" (OLPC). The main objective of the project is to provide free laptop access to all public primary school students and teachers. The project was extended and now includes students and teachers of the first years of middle school. The project combines the distribution of computers with a program to train teachers in the skills needed to use information technologies. In 2011, a government program was launched to train all Informatics teachers (1600 people) in programming and robotics. The school of Engineering of Universidad ORT Uruguay was selected to train 800 of those teachers using Scratch. In this presentation, we describe the main characteristics of the programming course, participants' opinions, and obtained results.

493 Self-Organized Session

240 Self-Organized Session

Concurrent Sessions, Friday 3:00-4:00

Event Space **The Use of Scratch and its Impact in OLPC Learning Communities**
Claudia Urrea, Sandra Barragan, Pedro Cuellar, Martin Perez, Carolina Garcia
OLPC programs around the world share not only the five guiding principles (ownership, saturation, connectivity, early aged, and open source software), but also the goal of providing children with opportunities they would hardly have otherwise. They have access to digital technologies and resources, and stay connected with other people in their communities and the rest of the world, but more importantly, they have the opportunity to use them to design, create and share projects, and while doing that, learn about learning. The one-to-one learning environment provides such an important opportunity to study the ways in which those children can use and program computers to rethink learning and what education is all about. In the context of this rich ecology of OLPC programs, the goal of the panel is to present the characteristics that make four programs different from one another and how Scratch has been used in concrete ways both in school and in after-school settings over the duration of each program. Members of the following four programs will join the panel to talk about individual experiences: Plan Ceibal in Uruguay, Educate in Colombia, Conectanos in Costa Rica, and OLPC in Rwanda.

633 **For the Win: Middle-Schoolers' Use of Scratch for the National STEM Video Game Challenge**
Quinn Burke, Yasmin Kafai, Chad Mote
While there are many efforts around creating tools and communities for game design, the emergence of online competitions is a recent phenomenon in engaging students in such activities. In this paper, we describe and analyze how a class of middle-school students participated in a national STEM video game challenge using Scratch. Over a period of three months, students designed, coded, and debugged their own video games, collaborating through a series of peer-to-peer and expert interactions. Our findings present the resulting games as well as the workshop model in which the role of authentic audiences was pivotal in the creation, revision, and submission of one's game. In our discussion, we explore how scaffolding audience feedback into a series of incremental stages plays a significant role in broadening a child's perception of what it is not only to compete but also collaborate on an increasingly wider—and even world-wide—scale.

Worksheets for "Small Videogame" Design and Development in Scratch
Rafael Fajardo, Scott Leutenegger
We have created a set of worksheets to help in the design and development of "small videogames" which we will share and release as open-source files in .svg, .pdf, and .ai formatted files. We will briefly step presentation attendees through a model use-case of the worksheets. We have adopted a specific definition for "small videogames" so as to give them a knowable form. Small videogames have the following attributes: 1. All gameplay occurs on a single screen; 2. The game has four screens: a startup, intro, or splash screen, a play screen, and two outcome screens, for example a "you win" screen and a "you lose" screen; 3. Small videogames are typically one-player games; 4. Small videogames can be created by an individual, novice creator in a time frame measured in days. Most visible videogames in the marketplace for consoles and personal computers are the product of many hands from multiple disciplines working for several years. The small videogame approach takes an individual through the whole process so the student can identify personal strengths and weaknesses while understanding roles and opportunities for collaboration.

525 Getting to Know Scratch 2.0
MIT Scratch Team
Want to try out the next generation of Scratch? In this hands-on workshop, you'll learn how Scratch 2.0 can open new opportunities for creativity and collaboration. You'll get a chance to explore some of the new features of Scratch 2.0: make your own programming blocks (procedures), share sprites and scripts between projects, use a webcam to sense movements in the world, and more. Members of the MIT Scratch Team will discuss ideas underlying Scratch 2.0 and strategies for using it.

244 Early Introduction of Programming Paradigms and Programming Language Vocabulary using Scratch
Matthew Meyer
For several years I have been using Scratch as the programming language within an "Introduction to Game Programming and Design" unit that is included in both a high-school computer science outreach program and within a college course on multimedia programming at Brooklyn College in New York. The game unit (a multi-lecture, multi-lab, project-based unit which is posted and freely available online) includes a lecture called "Introduction to Programming Languages." This lecture introduces students to concepts and terms that are not normally covered in an introductory-level course, but normally only introduced in more advanced classes on programming languages. I have found that introducing such advanced vocabulary early makes it easier not only for students to learn to create programs in Scratch but also to take the skills they acquire working in Scratch and transfer them into other languages. During this presentation, I will introduce the freely-available educational unit that we have created and illustrate how Scratch can be a wonderful tool for teaching students about advanced concepts such as programming paradigms.

The "Beauty and Joy of Computing" Curriculum and the AP CS: Principles Project
Brian Harvey
The College Board is planning a new "AP CS: Principles" exam for introduction in 2016. It is intended as a "CS 0" breadth course for non computer science majors, and in particular to attract women and minorities, very few of whom choose the existing "CS 1" level AP CS exam. Can an AP level course be taught using Scratch? Several colleges have taken the approach of starting in Scratch for one or two weeks, then switching to a traditional text-based language. "The Beauty and Joy of Computing" (BJC) is a CS Principles pilot course that uses Snap!, an extension to the Scratch language, throughout the course. BJC is half programming, half social context. We use the book *Blown to Bits* as the anchor for the latter, which also includes lectures, discussions, videos, industry guest speakers, and other readings. Both the social benefits and the social costs of computing are explored. The presentation is aimed at high school and college teachers who offer or are considering offering a CS 0 course that might include Scratch.

493 Self-Organized Session

240 Self-Organized Session

Saturday Keynote

Scratch Goes to School
Judy Barbera, Assistant Superintendent for Instruction
Sandra Reyes, Elementary STEM Coordinator
David Grammerstorf, 3rd Grade Teacher
Nicole Hovsepian, 3rd Grade Teacher
Andrea Edwards, Instructional Facilitator
Genna Colonnato, 3rd Grade Student
Jacob Goodman, 3rd Grade Student
Jason Kardon, 3rd Grade Student
Sarah Katz, 3rd Grade Student
Joe Ligresti, 3rd Grade Student
Moderated by Karen Brennan, MIT Media Lab

In school settings, Scratch is often viewed as an add-on – something that is done as a supplement to, not in connection with, curricular goals. But there are many ways that design-based learning with Scratch can be meaningfully integrated into school curriculum. In this session, students and teachers from the Ramapo Central School District share their experiences of integrating Scratch into a STEM unit of study.

Concurrent Sessions, Saturday 11:00-12:00

Event Space **Scratcher Show and Tell**
Hosted by Karen Brennan, Aaron Morris, Mylo Lam
Want to hear kids and teens talk about their Scratch projects and experiences? Join us for this fun and informal Show and Tell session.

633 **Injecting Computational Thinking into Computing Activities for Middle School Girls**
Heidi Webb
Often Computational Thinking (CT) concepts overlap one another and the skills needed to understand an abstraction required for a problem solution may be the same as those needed to decompose and understand the same problem which one is trying to solve. An after-school program consisting of a workshop series of computing activities was created to investigate which and how CT concepts and skills related to problem solving and abstraction could be injected into activities. Scratch was chosen as the primary programming environment to provide opportunities for middle school girls to learn one computing environment as the activities increased in complexity and still built on CT concepts already introduced in previous sessions. Each workshop concentrated on a specific computing artifact with concentration on problem solving and abstraction as it pertains to the design and implementation of computing solutions. This presentation will share the experiences and findings from using Scratch as the primary learning tool in the after-school workshops and summer program. It will also include discussion of how scaffolded examples, which built on CT concepts, contributed to building confidence in the middle school girls' attitudes about computing and motivated girls to solve problems using computing technologies.

Speaking the Language: Teaching Code Literacy in the Middle School Classroom
Cameron Fadjo, John Black
What does it mean to "do" programming? Is it just the coordination of seemingly disparate structures into an elegant system of events? Or is it something more poetic? How can the learner become literate in the fundamental aspects of computing? The answer to these questions lie, in part, in the core tenets of Code Literacy. A combination of computational media and new literacies with computational thinking, Code Literacy is an approach to teaching computer programming through the guided instruction of core computational thinking concepts and skills during computational artifact construction. In this presentation, we will outline the basics of Code Literacy using Scratch and discuss findings from an exploratory study on using a Code Literacy approach to teaching middle school students how to program. Utilizing a comprehensive, classroom-based, standards-aligned curriculum, we evaluated students on multiple factors (reflection responses, artifact content, and periodic assessment measures) to establish the extent to which each student learned fundamental computational thinking concepts during the construction of an individual digital artifact (such as a digital story, video game, or interactive novel). Findings from the current study will be presented and implications for improving the instruction of computing will be discussed.

525 Creating World Museum: Expanding Our Passions

Yoshiro Miyata, Nobuyuki Ueda, Yasushi Harada, Manabu Sugiura, Tomohiro Ueshiba, Tomoyuki Sowa, Lorraine Leo

Scratch has opened up for many children the possibility of creating their own expressions. We would like to propose that Scratch can also open up the possibility of creating a world for their own learning, rather than learning in a world someone else created for them, through cross-cultural and cross-generational collaboration. In our workshop, we will demonstrate activities developed through World Museum, an international network of collaboration involving many schools/groups from four countries. Our findings show that by starting from individual passions and expanding our vision to a more global world we could connect these local passions and find new passions with more global meaning. Our workshop will be constructed with the following flow of activities: Create: creating sprites to express our passions as individuals; Connect: creating interactions between the sprites and connecting our passions to construct and express more global meaning; Open: bringing these new meanings to the social contexts we come from (classes, schools, communities). In addition, we will incorporate puppet play, interactive animation through sound and touching using sensor-boards, and Real Time Documentation, which was presented at Scratch@MIT 2008 and 2010. Participants are encouraged to bring laptops to the session.

244 Making Together: Supporting Creative Collaboration in Scratch

Yasmin Kafai, Debbie Fields, Quinn Burke, Ricarose Roque, Amos Blanton

Since the Scratch website was launched in 2007, many collaborative activities have emerged, driven entirely by Scratchers themselves. Inspired by these collaborations, we designed collaboration events called Collab Camp, where we invited Scratchers to form groups and make Scratch projects together. We will share our experiences and discuss strategies to support creative collaboration in both online and in-person settings through constructive feedback, creating spaces to find partners, and resources to support co-creation of projects. We invite everyone to share their own experiences and challenges in supporting others to make together.

493 Self-Organized Session

240 Self-Organized Session

Getting Out

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

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.blueman.com/tickets/boston/

ImprovBoston
http://www.improvboston.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/

Acknowledgements

We are grateful for major financial support from the following organizations:

The National Science Foundation,
which has supported Scratch and ScratchEd through several research grants, including funding for this conference

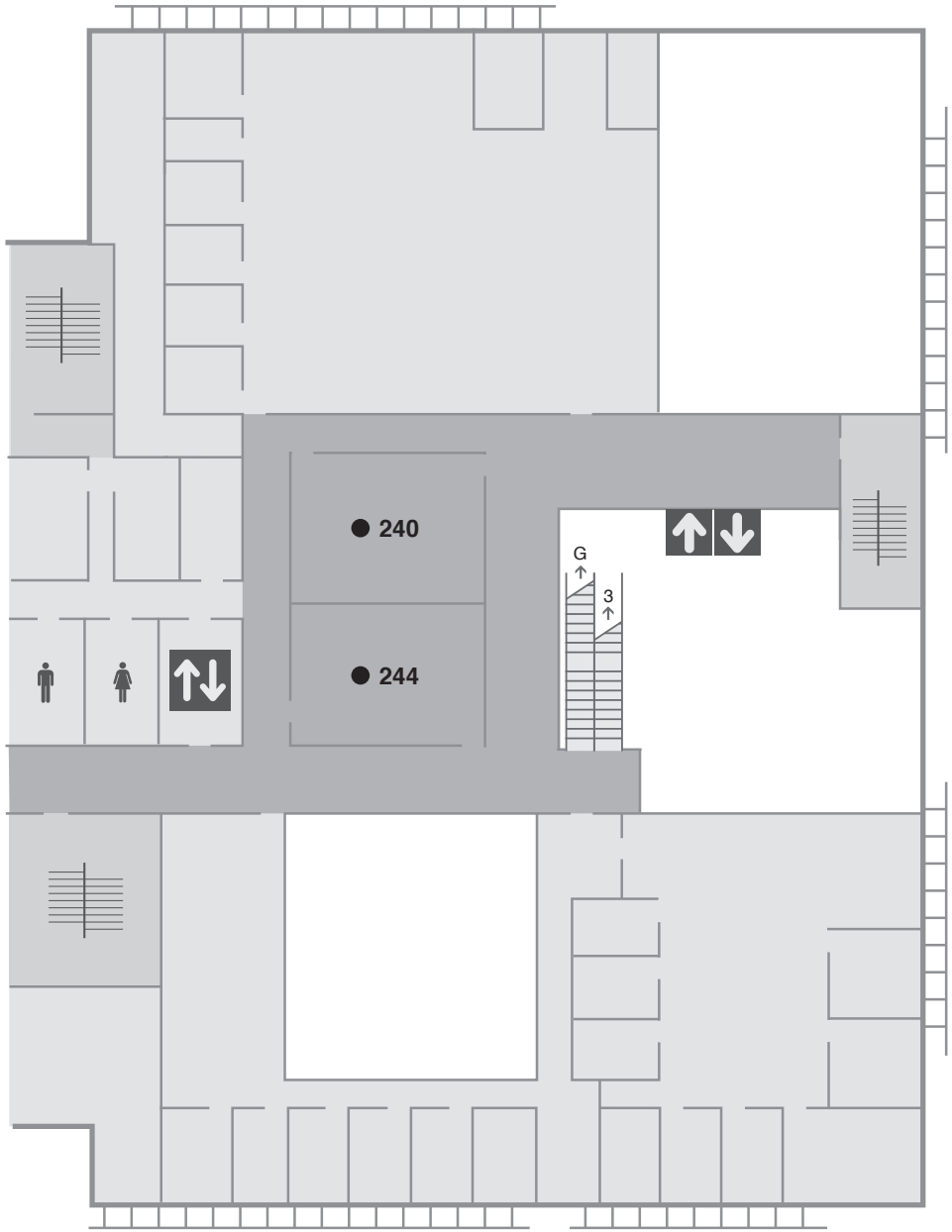
MIT Media Lab Research Consortia,
which have supported MIT students working on the Scratch project

Additional funding for the Scratch project has been provided by:

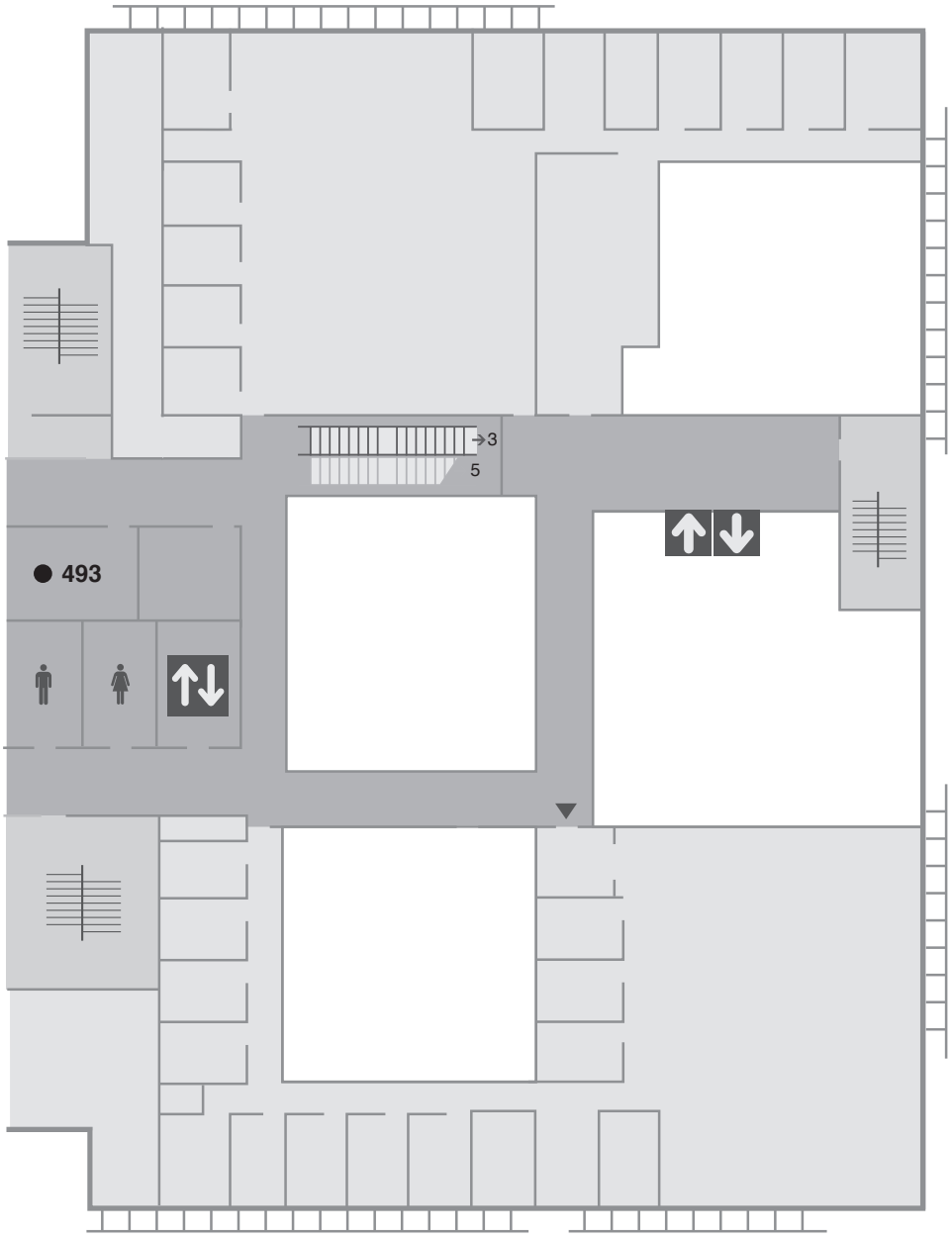
MacArthur Foundation
Google
Intel Foundation

Thanks to all faculty, staff, and students at the Media Lab for providing an inspiring and supportive environment for our Scratch research, helping with the organization and planning of this conference, and allowing us to take over large sections of the Media Lab building for this conference.

Second Floor

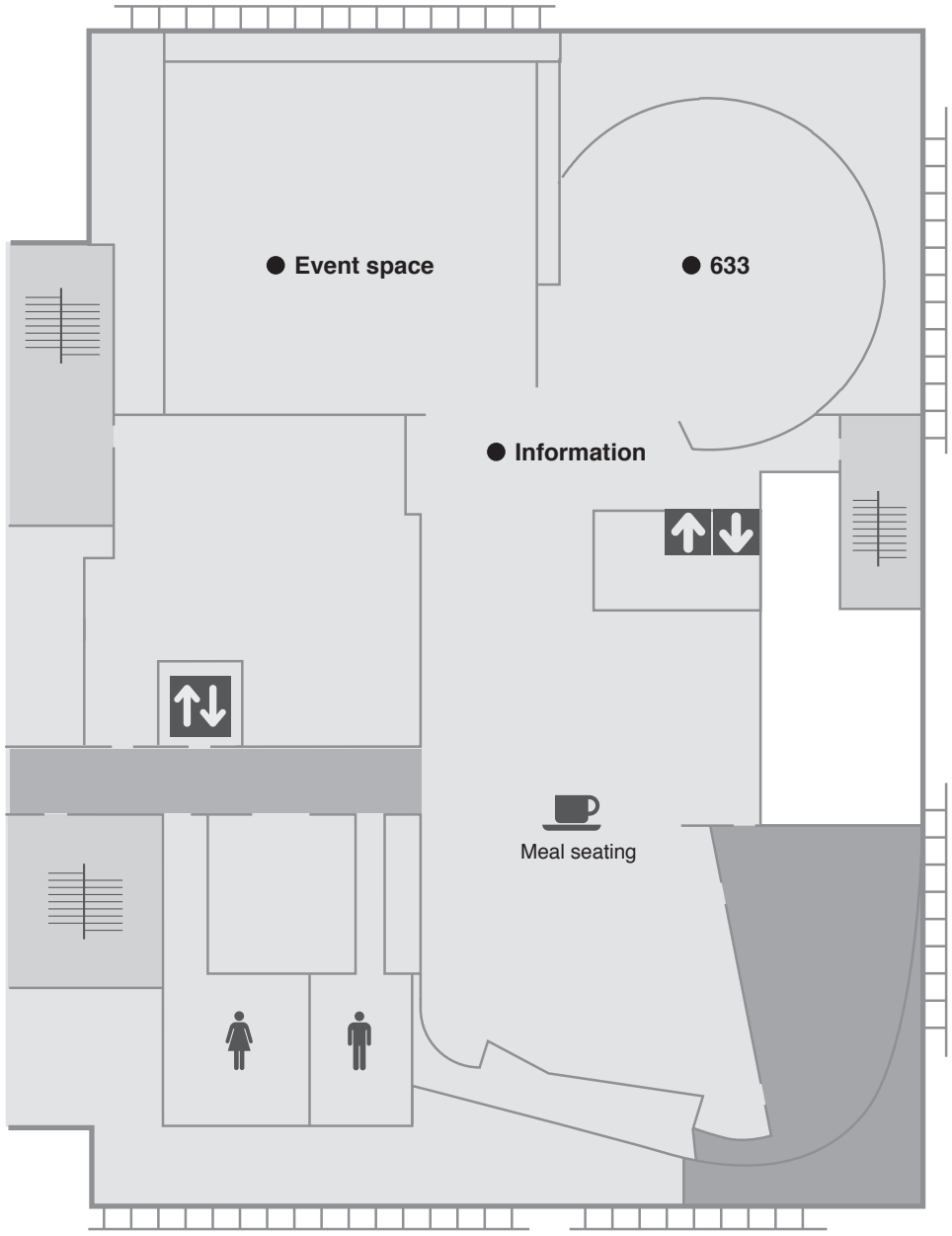


Fourth Floor



Fifth Floor

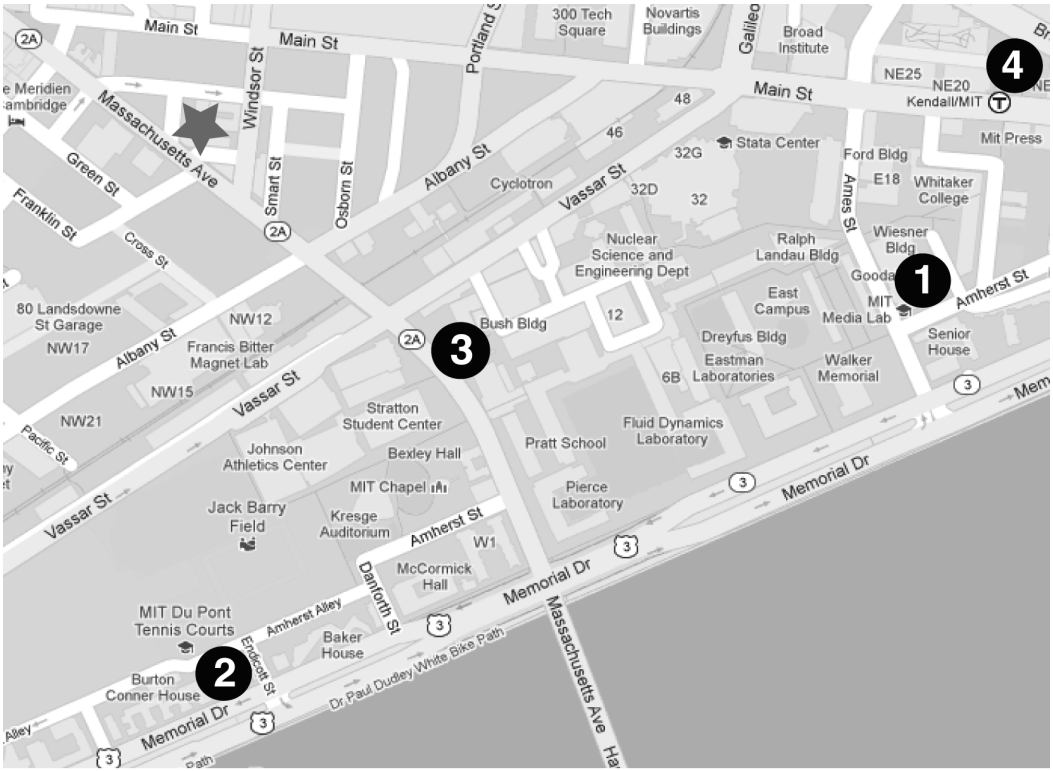
Sixth Floor



The MIT Museum is 0.7mi (1km) from the MIT Media Lab and there are many ways to get there.

1. MIT Media Lab - Join MIT Scratch Team members in a walk to the museum or board the free MIT shuttle that will depart every 15 minutes from the Lab.

2. MIT dorms - Enjoy a 15-minute walk from Burton Conner House or board the free MIT shuttle that will depart every 15 minutes from the dorm.

3. Bus - A bus departs every 7 minutes from main campus at 77 Massachusetts Avenue. Board the #1 bus toward Harvard and travel two stops to Landsdowne Street. Cost: $2

4. Taxi - Taxis are available on Main Street in front of the Chipotle restaurant and in front of the Marriott Hotel.