

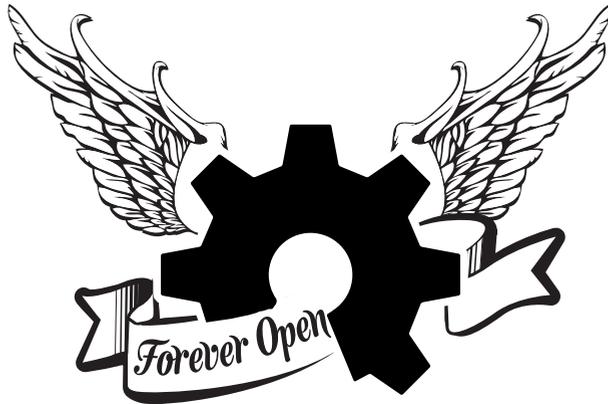
CATALYSTS



New York Hall of Science



New York Hall of Science
www.openhardwaresummit.org



OVERVIEW

The Open Hardware Summit is in its second iteration at the New York Hall of Science. Last year, 350 people came together to share knowledge about bringing open hardware to market, solving issues around open design, protocols and licensing. Many more people watched online and got involved in the conversation through the forums, the mailing lists, and twitter. Together with support from you, we have gained more momentum as a community. The Open Source Hardware (OSHW) definition we signed last year was turned into a license by CERN. We chose a logo through popular vote to designate a piece of open source hardware as such. The Summit continues to be about the DIY, maker, small scale (and growing up) fabrication movements and legalese around open source hardware. Thank you to our team, volunteers, sponsors, friends and families who have helped support us along the way!

ORGANIZERS



Alicia Gibb Bug Labs

Alicia Gibb is a researcher and prototyper at Bug Labs where she runs the academic research program and the Test Kitchen, an open R&D Lab. Her current projects center around developing new lightweight additions to the BUG platform, as well as a sensor-based data collection modules. She is a member of NYCResistor, co-chair of the Open Hardware Summit, and a member of the advisory board for Linux Journal. She holds a degree in art education, a M.S. in Art History and a M.L.I.S. in Information Science from Pratt Institute. She is self-taught in electronics. Her work has appeared in Wired magazine, IEEE Spectrum, Hackaday and the New York Times. When Alicia is not researching the crossroads of open technology and innovation she is prototyping artwork that twitches, blinks, and might even be tasty to eat. www.aliciagibb.com



Ayah Bdeir littleBits

Ayah Bdeir is an engineer and interactive artist who received her masters degree from the MIT Media Lab. Her work has been featured at the Museum of Modern Art (MoMA), the New Museum, and the New York Times Magazine among others. Ayah is now a fellow with Creative Commons doing research in Open Hardware including spearheading the first Open Hardware definition and co-chairing the Open Hardware Summit at the New York Hall of Science. Bdeir is the creator of littleBits, an award winning kit of pre-assembled circuits that snap together with tiny magnets, now in production. She is also the founder of Karaj, Beirut's lab for experimental art, architecture and technology.

www.ayahbdeir.com
www.littleBits.cc



Charles Pax Demo Chair

Charles Pax manages the department of research and development at MakerBot Industries and hacks at Brooklyn-based hackerspace, NYC Resistor.



Joe Saavedra Chief Twitterer

Joe Saavedra is an artist, teacher, and maker living and working in NYC. He's had work exhibited in Asia, Europe, and the US, most recently engineering an exhibition based on DIY environmental sensors distributed globally and interpreted in real-time at the National Art Museum of China in Beijing, July - August 2011.



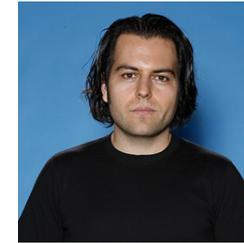
Hirumi Nanayakkara Scholarship Co-Chair

Hirumi Nanayakkara is an MFA candidate in Design and Technology at Parsons the New School for Design. Hirumi is a design strategist & interaction designer currently focusing on using mobile technology, new media and interaction design to further affect social change in areas of sustainability, social justice and education.



Oylum Boran Scholarship Co-Chair

Oylum Boran is an interaction designer and creative technologist, from Turkey, currently living in New York City. She is pursuing her master's degree at Parsons Design + Technology, as a Fulbright grantee. Her main interest is to utilize social media and new technology to raise awareness in the issues of sustainability, environment and education.



Phillip Torrone Publicity Chair

Phillip Torrone is Senior Editor of Make: Magazine. He has authored and contributed to numerous books on programming, mobile devices, design, hardware hacking and is also a contributing editor for Popular Science. In addition to MAKE, Phillip is creative director at Adafruit Industries, a New York City based open source hardware and electronic kit company. Prior to MAKE, Phillip was director of product development for creative firm Fallon Worldwide, how-to editor for Engadget and founder of the popular electronics site Hack-a-day.



Odile Dumbleton Sponsorship Chair

Odile Dumbleton got her first museum job in Chicago after obtaining her BA in History from DePaul University. She has worked in several museums and libraries across the New York area including the archives at both The Metropolitan Museum of Art and the MTA's Transit Museum, and also at the Central Branch of the Brooklyn Public Library as the Microfilm Librarian. Recently re-located to the Seattle area, she is currently a volunteer with the Special Collections division of the University of Washington. She looks forward to getting back to New York City in September.



Shelby Arnold Paper Engineer

Shelby Arnold is a paper engineer, designer and hacker in Brooklyn. She likes to make pop-up books with electronics in them and hang out at NYCResistor. Sometimes she teaches paper engineering and bookbinding classes there.

OHS TEAM



William Ward IT Chair

William Ward has bounced between systems administration and networking for 15 years. As a member of NYC Resistor, he enjoys

building new devices to act as electronic duct tape for everyday problems. Among his favorite tools are the Arduino, Bug Labs Bug development platform, and his Nook Color. William is currently pursuing a masters degree in Computer Science at NYU.



David Mellis Review Chair

David Mellis is a graduate student in the High-Low Tech group at the MIT Media Lab and the lead software developer for the

Arduino project. Before coming to MIT, he earned a master's at the Interaction Design Institute Ivrea and taught at the Copenhagen Institute of Interaction Design.



Kipp Bradford Captain Awesome

Kipp Bradford is an educator, technology consultant, and entrepreneur with a passion for creating new products as

well as finding new applications for existing technologies. Kipp co-founded Revolution By Design, Inc, a non-profit education and research organization dedicated to empowerment through technology and co-organizes Rhode Island's mini Maker Faire. He is the founder of KippKitts, LLC, an open source hardware company. As the Senior Design Engineer and Lecturer at the Brown University School of Engineering, Kipp teaches several engineering design and entrepreneurship courses. He is also on the technical advisory board of MAKE Magazine.



Catarina Mota Ticketing Chair

Catarina Mota is co-founder of openMaterials (a research group dedicated to collecting and sharing data on uses and production methods of materials), of altLab (Lisbon's hackerspace), of fabriCulture (a project dedicated to promoting open source digital fabrication and maker culture in general), and a member of NYCResistor. She's also a PhD student researching social, cultural and political aspects of open source hardware and digital fabrication, a visiting scholar at ITP-NYU, and a fellow of the National Science and Technology Foundation of Portugal.



Jacob Gibb Photography Chair

Jacob Gibb has been creating images ever since purchasing his first camera at the age of 12. Although he is slightly more grown up now, photography still provides the same allure it did with that very first roll of film. By day Jacob is a mechanical engineer working in the medical field. He is well versed in the open source hardware movement as his sister, Alicia Gibb, enjoys bouncing ideas off him, collaborating and discussing perspectives with him.



Mateo Zlatar Graphics Wiz

Mateo Zlatar is a graphic designer with a career in Art Direction, and UI design. Mateo has been Bug Labs' art director since

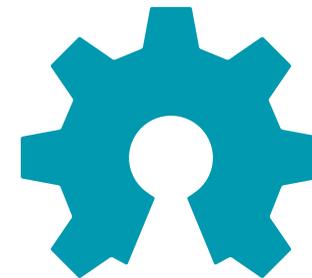
it inception in 2006 and has contributed to a number of other open technology efforts, including the build framework for embedded Linux OpenEmbedded, Concierge OSGI and the Open Hardware Summit.

SCHOLARSHIP

The Open Hardware Summit (OHS) is announcing its first Open Hardware scholarship this year! The OHS scholarship will support emerging artists, inventors and developers by providing funding for projects that are released as Open Source Hardware. Granting these funds is an opportunity to draw attention to the Open Source Hardware movement, to give back to the DIY community, and to give you the chance to join a growing roster of game changers in Open Source Hardware history. Last year, the Open Hardware Summit had \$2,000 USD left over from our funds and we thought the best way to use it is to give it back to the community.

We need your vote! View the videos of the submissions and vote for your favorite Open Hardware Project online at www.openhardwaresummit.org/scholarship. The deadline to vote is 5.59pm Thursday September 15th, 2011 during the Summit. Make sure you vote before the Demos and cocktails!

Have Any Tips on Making Open Hardware? A tip jar will be in the lobby of the auditorium to add your cash tips and advice to the winner of the Open Hardware Scholarship. Help them create a successful and open source project!



**open source
hardware**

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SCHEDULE

- 8:30 am Breakfast & Registration**
- 9:30 am Welcome, Opening Remarks**
 Peter Semmelhack (Bug Labs), Alicia Gibb (Bug Labs), Ayah Bdeir (littleBits)
- 10:00 am The Big Picture**
- **Keynote:** The Arduino Team: *Arduino Confidential*
 - Kate Hartman, OCAD University: *Edges, Openings, and In-Betweens*
 - Eric Wilhelm, Instructables: *K'Nex Guns: How 13-year-olds and rubberbands power an open-source hardware community*
 - **Bunnie Huang, Chumby:** *Why the Best Days of Open Hardware are Yet to Come*
- 11:30 am Open Source Hardware Legal Landscape**
- Myriam Ayass, CERN: *CERN's Open Hardware License*
 - Dr. Alison Powell, OHANDA: *Developing an Open Hardware Standard*
 - Michael Weinberg, Public Knowledge: *Not Everyone is Excited: Protecting 3D Printing and Open Hardware in Washington, DC*
- 12:00 pm Lunch (will be provided)**
- 1:30 pm Open Hardware & Social Change**
- Gabriella Levine, Protei: *Open Oceans and Open Hardware: Protei, a proliferating fleet of DIY sailboat drones to clean up oil spills*
 - Shigeru Kobayashi, Gainer: *Case Studies of Open Source Hardware: the Nuclear Accident in Japan*
 - Zach Lieberman, YesYesNo: *The Eyewriter Initiative*
- 2:00 pm Forging an Open Hardware Community**
- Eric Craig Doster, iFixit: *Opening up hardware communities: ten lessons from iFixit*
 - Autumn Wiggins, The Upcycle Exchange: *Open Source and Indie Craft*
 - Bre Pettis, MakerBot: *Robots, Clocks and Gangstas OH MY!*

SUPPORTER



PLUS!

- 2XL Networks, Inc.
- Cute Digi
- Jack Linke, US Marine stationed in Afganistan
- Bean Capers
- Kevin Smith
- Nicolas Saugnier
- Ben Krasnow
- Bryan Thomas

SPONSORS

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2:30 pm From Small Scale Fabrication to Large Scale Collaboration

- John Sarik & Haig Norian, Columbia University: *Open Sourcing the Integrated Circuit*
- Geoffrey Barrows, Centeye: *Open Source Embedded Vision Sensors*
- Addie Wagenknecht and Stefan Hechenberger, NORTD Labs: *Tackling Reproducibility – The Lasersaur Project*
- Daniel Reetz: *DIY Book Scanning: Open Hardware for Open Content*
- Mark Norton, Open Source Ecology: *The Open Source Ecology Steam Engine Project*
- Bruce Perens, founder of OSI: *Open Hardware in Space*

3:30 pm Break

4:00 pm Starting up in Open Hardware

- Amanda Wozniak, Wyss Institute: *Open-Sourcing the Engineering Process*
- James Bowman: *Gameduino Story: Kickstarter to product in 90 days*
- Benedetta Piantella & Justin Downs, Ground Lab: *Labor over Capital: how open development sustains small business and drives innovation*
- Bryan Newbold, Octopart: *Don't Let Price-Breaks Break the Bank: Economics of Electronic Components for Small Buyers*
- Nathan Seidle, Sparkfun: *Where does transparency end?*
- Mitch Altman, Cornfield Electronics: *Manufacture Your Project (and make a living doing what you love)*

5:00 pm Breakout Sessions

6:30 pm Cocktails and Demo Hour: Closing Remarks and Open Hardware Scholarship Winner Announcement

Dale Dougherty (Make), Alicia Gibb (Bug Labs), Ayah Bdeir (littleBits)

BREAKOUT SESSIONS

(please consult the map in your goodiebag to locate your room)

B1 Documentation, Distribution, and Community Building for Open Hardware

Britta Riley (Window Farms), Josef Průša (RepRap), Taylor Hokanson (DIYLILCNC), Zak Homuth (Upverter)

B2 Open Source Hardware Legal Frameworks

Melba Kurman (Triple Helix Innovation), Tim Engelhardt (JBB), Rachel Vaughn (Weyerhaeuser)

B3 Challenges and Opportunities for Open Hardware for Infectious Disease Detection

Nancy Burgess, CIV (Defense Threat Reduction Agency)

B4 Open Hardware in Education

Brian Evans (Metropolitan State College of Denver), Paulo Blikstein (Stanford), Timothy Marzullo (Backyard Brains), Jon Santiago (Htink)

B5 What Open Hardware Needs from the Cloud

Rob Faludi & Jordan Husney (Digi)

B6 Hacking materials: easy and affordable solutions for DIY and open hardware projects

Catarina Mota (Open Materials), Nick Vermeer (NYCResistor)

B7 Open Hardware in Voice Telecommunications

Alexander Chemeris (Fairwaves), Xavier Carcelle (IPBX)

B8 Real time programming with Arduinos using WebSockets

Justin Mclean (class SOFTWARE)

B9 Spurring Creativity in the Marketspace: An Evolutionary Model of Social Hardware

Emanuela Prandelli, Gianmario Verona & Remo Giovanni Abbondandolo (Universita Commerciale Luigi Bocconi)

B10 Fast forward from alpha- Agile Open Hardware Manufacturing

Ian Lesnet (Dangerous Prototypes), Eric Pan (Seeed Studio)

B11 Learning By Doing

Nicolas Villar (Microsoft R&D), Yury Gitman & Joel Murphy (Rachel's Electronics), Dan Steingart (City College), Matt Sinclair (Matt Sinclair Design), David Rosales (Fossil)

B12 MAKEability

Sam Sayer & Laine D'Augustine (MITRE)

B13 Interfacing Electronics and Computers Using Python and Data Acquisition Hardware

Dale Short & Calvin Ball (Cooper Union)



Autumn Wiggins operates The Upcycle Exchange, an experimental platform that reclaims post-consumer materials for makers, which evolved into a retail store and open franchise offering supplies at pay-as-you-wish pricing. A former PC tech and open source software enthusiast, she advocates for the adoption of open principles within the indie craft community.



Eric Wilhelm has a Ph.D. from MIT, runs Instructables.com -- a site attracting 10 million people per month--, and recently sold his company to, and now builds communities for, Autodesk. He has flown powered exclusively by kite, competed in an ultra-marathon, and is recognized as a top innovator under 35.



Amanda 'w0z' Wozniak is a Boston-based electrical engineer and MIT alumna. Formerly of Analog Devices, she is currently a Staff Engineer at the Wyss Institute for Biologically Inspired Engineering. Wozniak believes engineering should empower individuals to understand and influence both technology and the society that has arisen from it.



John Sarik is a PhD candidate at Columbia University. John is a hardware hacker and his research interests include open hardware for education and printable electronics.



Nathan Seidle is CEO of SparkFun Inc. in Boulder, Colorado, a company he founded in 2003 as an undergraduate student in electrical engineering. The company, which has grown to over 130 employees, provides tools, hardware, and other resources for artists, engineers, prototypers, and hobbyists to “play with cool electronic gadgetry”. He is an accomplished engineer, innovator, and bootstrapping entrepreneur.



Peter Semmelhack is the founder and CEO of Bug Labs, the company behind BUG, the modular, open source electronics and web services platform. Peter engineered the idea for Bug Labs on the belief that communities should have the power to create and share. As a founding member of the rapidly growing open hardware movement, his work has been covered and discussed by the international media including The New York Times, The Economist, The Hindu, Fortune, CNN, Nikkei Business and Forbes.



Addie Wagenknecht and Stefan Hechenberger at Nortd
Over the last half decade, nortd’s open source hardware has been built and used by thousands of people, labs, hacker-spaces and universities worldwide. We believe that people should think globally and build locally. Nortd was founded as an international open source collaborative, outputting artistic research and scientific development for humanity. More information at labs.nortd.com.



Michael Weinberg is a Senior Staff Attorney and Innovation Evangelist at Public Knowledge, where he focuses primarily on copyright, issues before the FCC, and 3D printing. He is also the author of It Will Be Awesome if They Don’t Screw it Up: 3D Printing, Intellectual Property, and the Fight Over the Next Great Disruptive Technology.

DEMOS

- D1 Bluetooth remote control for Winamp with Skype & USB multimedia keyboard capabilities**
Mathieu Stephan
- D2 Indoor RGB led matrix display for domotics uses**
Mathieu Stephan
- D3 Bug Labs**
- D4 PandaBoard: an open software development platform**
Nipuna Gunasekera
- D5 Ikimo: a low cost fully open source—from chassis to brain—robot platform**
David Siren Eisner
- D6 The CloudSensorSock: a wearable open hardware and software platform for managing health sensor data on the Cloud**
Charalampos Doukas
- D7 TurtleBot in Action (a Completely Open Source Robot)**
Melonee Wise
- D8 Thermal Tweeter: a networked Twitter printer**
Ian Lesnet
- D9 Introducing Open Design Engine: A Collaboration Portal for OSHW**
Greg Moran
- D10 The Making of a Button-sized Heartbeat Pulse Sensor that’s Arduino Plug’and’Play and otherwise awesome**
Yury Gitman
- D11 BeTTY: Open platform for teaching Physical Computing**
Nikita Pashenkov
- D12 OTOduino: software modem for your original iPhone hardware development**
Akihiro Uehara

DEMOS

- D13 Nanode: A low Cost Open Source Platform to Kickstart the Internet of Things**
Ken Boak
- D14 Pants Interface: Open Source Wearable Controller**
Rachel Lyra Hospodar
- D15 Lissadunio: Open microcontroller platform for wireless applications**
Michael Harris
- D16 littleBits**
Ted Ullrich & Ayah Bdeir
- D17 Neuroscience for Everyone**
Timothy Marzullo
- D18 ArduEye Vision Sensors**
Geoffrey L. Barrows
- D19 RhythmSynthesis**
Ryan Raffa
- D20 MakerBot: open source 3D printing**
Keith Ozar
- D21 Taking .NET Gadgeteer Out of the Lab**
Nicolas Villar
- D22 olyMEMS**
Carson Au
- D23 Upverter: Open & Free Cloud Based EDA**
Zak Homuth
- D24 DIY Sous Vide: Temp Control Through Arduino-like Embedded Software**
Lisa Qiu and Abe Fetterman
- D25 Meet Meta Watch**
David Rosales



Bruce Perens is one of the founders of the Open Source movement in software. He is best known as the creator of the Open Source Definition, the rule-set for Open Source (and now Open Hardware) licensing, and is one of the best-known evangelists of Open Source. Perens spent 19 years writing software for the film industry, 12 of them at Pixar, and is credited on the films Toy Story II and A Bug's Life. Today, Perens advises corporations and government on issues of Open Source.



Bre Pettis is a co-founder of Makerbot, a company that produces robots that make things. Bre is also a co-founder of NYCResistor, a hacker collective in Brooklyn. He's made a lot of videos, taught as a schoolteacher and is passionate about invention, innovation, and all things DIY.



Bendetta Piantella and Justin Downs at Ground Lab
GROUND Lab is a Research and Development company that focuses on creating innovative sustainable and open source solutions for social, environmental and humanitarian challenges. GROUND Lab has designed and fabricated prototypes and solutions for a wide range of clients, ranging from large organizations like UNICEF to smaller NGOs, Universities, Wildlife Conservation organizations and Artists.



Dr. Alison Powell is LSE Fellow in Media and Communication at the London School of Economics, teaching and researching on the development of open movements as well as the standards, policies, cultures and debates that are shaping the future of the internet. She is a member of the European Network of Excellence on Future Internet Science. She likes to make cakes, gardens, and strange objects.



Daniel Reetz is an artist, a hacker, and an engineer. He is best known as the founder of the DIY Book Scanner community, a thousand-strong group developing Open Source Hardware and Software that exploit cheap cameras to scan books quickly, especially in environments where traditional scanning is unaffordable or impossible. He recently joined the Internet Archive, where he is developing an Open Hardware book scanner.



Gabriella Levine is an interactive artist and hardware designer, currently attending ITP at NYU. She works on a variety of projects with the means of physical computing, including Protei, developing a robotic, shape-shifting sailboat with the means of absorbing oil sheens from the sites of oil spills.



Zachary Lieberman is an artist with a simple goal: he wants you surprised. His work uses technology in a playful way to break down the fragile boundary between the visible and the invisible. Most recently, he helped create visuals for the facade of the new Ars Electronica Museum, wrote software for an augmented reality magic trick, and helped develop the eyewriter. In 2010 he was named one of 100 Creative People in Business by Fast Company Magazine. The eyewriter recently won Design of the Year (Interactive) from the London Design Museum and the Golden Nica (Interactive) from Ars Electronica. Lieberman is co-creator of openFrameworks, an open source C++ toolkit for creative coding.



Bryan Newbold cut his teeth listening for black holes in the cosmos and looking at friendly sea stars on the Polar seafloor, then went on to popping caps and writing libraries at an open hardware startup. Now he works for Octopart right here in New York City.



Haig Norian is a PhD candidate at Columbia University. Haig is an IC design ninja and his research involves the development of novel microfluidic on silicon chip systems.



Mark Norton is a long time contributor to open source software efforts like the Sakai and Kuali Projects (course management and university financial software). In April of 2011, he has shifted his organizational skills and development experience to supporting the Open Source Ecology project founded by Marcin Jakubowski in 2003. Mr. Norton is the project leader of the Open Source Ecology (<http://www.opensourceecology.org>) Steam Engine Project.

- D26 White Rabbit: sub-nanosecond synchronization in Ethernet**
Tomasz Wlostowski
- D27 fabrickit: a toolkit for wearable technology**
Zach Eveland & Despina Papadopoulou
- D28 Signal Strength: a project to advance mobile democracy**
Amelia Marzec
- D29 Chumby's new FPGA-connected Linux computer capable of video overlay on HD video feeds**
Bunnie Huang
- D30 Milkymist One: a video synthesizer based on an open source system-on-chip design**
Sebastien Bourdeauducq
- D31 Open Hardware in Academia**
Jeremy Blum
- D32 Snootlab PowerMeter: a DIY electrical monitoring system**
Frédéric Jourdan
- D33 Self-serve programming tools with the Rascal**
Brandon Stafford
- D34 Firefly: An Interactive Prototyping Environment**
Andrew Payne
- D35 Developing home applications for ubicomp using various toolkits**
Koji Tsukada
- D36 Kippkitts**
Kipp Bradford



Mitch Altman is a San Francisco-based hacker and inventor, known for inventing TV-B-Gone remote controls, co-founding a RAID controller company, doing pioneering work in Virtual Reality, contributing to MAKE Magazine, traveling the world teaching people to solder, and co-founding Noisebridge hackerspace. Mitch is president and CEO of Cornfield Electronics.



Eric Doster is a key member of the iFixit team, focusing specifically on empowering organizations to become more effective teachers and retailers through effective content marketing enabled by Dozuki (iFixit's new software platform).



Arduino Team Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. It's intended for artists, designers, hobbyists, and anyone interested in creating interactive objects or environments. Arduino received an Honorary Mention in the Digital Communities section of the 2006 Ars Electronica Prix. The Arduino team is: Massimo Banzi, David Cuatrecasas, Tom Igoe, Gianluca Martino, and David Mellis.



Dale Dougherty is the founder of Make magazine and the creator of Maker Faire. He is GM of Maker Media at O'Reilly Media in Sebastopol, California. Dougherty is a co-founder of O'Reilly Media, a technical publisher and conference organizer known for its advocacy of Open Source and the Web. Dale was the developer of Global Network Navigator, the first commercial Web site launched in 1993. He coined the term Web 2.0 as part of developing the Web 2.0 Conference.



Myriam Ayass is Legal Advisor for the Knowledge Transfer Group at CERN, the European Organization for Nuclear Research. She gained her LLM from Queen Mary, University of London, specialising in Intellectual Property Law, and a DEA from the Graduate Institute of International Studies. She joined CERN in 2005 after a period at the WHO, and has been working in the field of technology transfer since that date. As such, she drafts all the Knowledge and Technology contracts of CERN since end of 2005, and generally provides advice on intellectual property issues for the Organization.



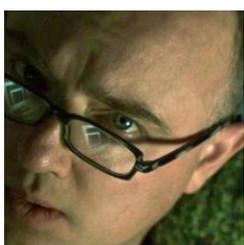
Kate Hartman is an artist, technologist, and educator whose work spans the fields of physical computing, wearable electronics, and conceptual art. She is the co-creator of Botanicalls and the Lilypad XBee. Her work has been exhibited internationally and featured by the New York Times, BBC, CBC, NPR, in books such as "Fashionable Technology" and "Art Science Now". She was recently a speaker at TED 2011 and her work is currently on view in the "Talk to Me" exhibition at the Museum of Modern Art in New York. Hartman is based in Toronto where she is the Assistant Professor of Wearable & Mobile Technology in the Digital Futures program at OCAD University. www.katehartman.com



Geoffrey Barrows is the Founder of Centeye, a company that makes image sensor chips and compact vision sensors for robotics and embedded vision. He holds a Ph.D. in electrical engineering from the University of Maryland, and was named to the MIT Technology Review's TR-100 list in 2003.



Bunnie Huang is a nocturnal hardware hacker. He enjoys the design and redesign of systems at all levels, from silicon to boards to firmware and beyond. His most recent contributions include the portfolio of chumby hardware products. He enjoys living in Singapore and regularly wallows in the electronics markets of Shenzhen.



James Bowman's background is in games and graphics. He wrote games for 8- and 16-bit consoles. Later he made graphics software and hardware at SGI, 3dfx, and NVIDIA. He currently uses the Arduino at an open source robotics company.



Shigeru Kobayashi worked for a digital musical instrument company as a sound designer and a software engineer. He is now teaching interaction design and prototyping at Institute of Advanced Media Arts and Sciences [IAMAS]. He designed OSH such as Gainer and Arduino Fio (with SparkFun) and wrote books on physical computing and prototyping.