

E.I.T. Links

From “self-service” to “room service”:
How Emerging Information Technologies are changing the way we live

“The future is like heaven. Everyone exalts it, but no one wants to go there now.”
 – James Baldwin

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Editor’s Note:

Please feel free to pass on the newsletter to those interested. *Anyone wishing to receive future editions of the newsletter, please email me at: sknode@gmail.com.*

Note: This newsletter contains links found during Apr 2013, and all of the links were working at time of publication.

Remember, all links mentioned here and all prior newsletters are available at:

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

Anyone seeking more frequent updates can follow my ‘tweets’ via my twitter account, <http://www.twitter.com/sknode>

I am now “blogging” at my blogspot account, <http://sknode.blogspot.com/>.

Links for this Issue

AI General

- [Deep Learning](#) – Deep-learning software attempts to mimic the activity in layers of neurons in the neocortex, the wrinkly 80 percent of the brain where thinking occurs. The software learns, in a very real sense, to recognize patterns in digital representations of sounds, images, and other data.

Brain

- [Flip of a single molecular switch makes an old brain young](#) – The flip of a single molecular switch helps create the mature neuronal connections that allow the brain to bridge the gap between adolescent impressionability and adult stability. Now Yale School of Medicine researchers have reversed the process, recreating a youthful brain that facilitated both learning and healing in the adult mouse.
- [Transparent Brains Reveal Hidden Microscopic Details](#) – Researchers at Stanford University have developed a chemical process to strip away the fats from a (dead) brain, leaving only transparent tissue that still retains its three-dimensional structure.
- [Memory Implants](#) – Memory implants are close to becoming a realistic approach to enhancing memory.
- [Scientists Build Baseball-Playing Robot With 100,000-Neuron Fake Brain](#) – Researchers at the University of Electro-Communications in Tokyo and the Okinawa Institute of Science and Technology have built a small humanoid robot that plays baseball — or something like it. The bot can hold a fan-like bat and take swings at flying plastic balls, and though it may miss at first, it can learn with each new pitch and adjust its swing accordingly. Eventually, it will

make contact.

- [Training the Brain to Improve on New Tasks](#) – A brain-training task that increases the number of items an individual can remember over a short period of time may boost performance in other problem-solving tasks by enhancing communication between different brain areas. The new study being presented this week in San Francisco is one of a growing number of experiments on how working-memory training can measurably improve a range of skills – from multiplying in your head to reading a complex paragraph.

[Data Mining/Business Intelligence](#)

- [Pop Goes the Algorithm](#) – Algorithms that can predict the next great music hit are growing in ability and acceptance.
- [New Algorithm Helps Evaluate, Rank Scientific Literature](#) – Keeping up with current scientific literature is a daunting task, considering that hundreds to thousands of papers are published each day. Now researchers from North Carolina State University have developed a computer program to help them evaluate and rank scientific articles in their field.

[Decision making](#)

- [Towards Robot Scientists for autonomous scientific discovery](#) – Robert Pearl, CEO of The Permanente Medical Group, explores the idea of using artificial intelligence and clinical support systems to replace traditional, human-centered diagnosis and treatment paradigms with more scientific, data-driven methods.

[Decision Support Systems](#)

- [The Future of Healthcare: Artificial Intelligence & Clinical Support Systems](#) (video) – Robert Pearl, CEO of The Permanente Medical Group, explores the idea of using artificial intelligence and clinical support systems to replace traditional, human-centered diagnosis and

treatment paradigms with more scientific, data-driven methods.

[Educational Technology](#)

- [Essay-Grading Software Offers Professors a Break](#) – EdX, the nonprofit enterprise founded by Harvard and the Massachusetts Institute of Technology to offer courses on the Internet, has just introduced such a system and will make its automated software available free on the Web to any institution that wants to use it. The software uses artificial intelligence to grade student essays and short written answers, freeing professors for other tasks.
- [Adafruit launches educational show aimed at kids](#) – Adafruit has just provided their first lesson for kids, entitled “A is for Ampere”.
- [Education Finally Ripe For Radical Innovation By Social Entrepreneurs](#) – The technology-enabled transformation currently under way WILL radically improve access to high quality education across the globe.

[Future](#)

- [Science and a new kind of prediction: An interview with Stephen Wolfram](#) – Stephen Wolfram, creator of the Wolfram|Alpha search engine and author of the books *Mathematica* and *A New Kind of Science*, is known all over the world for his contributions to our understanding of computation. In 2012, he received a lot of attention for something else: At the SXSW show, he revealed that he had a more than 20-year personal computational log of, basically, the life of Stephen Wolfram. This included everything from every e-mail he had sent, to when he had gone to bed, to how long his phone conversations lasted, and much more. He then released this data on his personal blog.
- [The New Digital Age: Reshaping the Future of People, Nations and Business](#) – Into an air of great anticipation, Eric Schmidt and Jared Cohen have published *The New Digital Age*. The book takes an old idea --

that there are both digital and physical worlds -- and extends it, arguing that today nothing less than two civilizations have arrived. One developed over thousands of years and the other is in its infancy. One is a world of old cultures, nation states, governments, institutions, power structures and laws. The other is a dynamic, ungoverned, even anarchistic world where boundaries are porous, rules unclear and where power is resilient and distributed. While these two co-exist, each restraining the negative aspects of the other, they increasingly come into conflict.

- [Six 'Megatrends' That Will Shape The Future Of Digital Media](#) – The set of six digital content “megatrends” are as follows:
 - Content distribution models are shifting towards instantaneous, ubiquitous access, often using social networks
 - New technologies, big data, and the growth of virtual content are reshaping the creative economy landscape
 - The traditional lines between content creators and content consumers are blurring, with consumers playing an increasingly important role in collaborative content creation
 - Business models for digital content distribution are changing, with licensing and service-based delivery models replacing traditional sales-based distribution
 - Commerce in creative works is increasingly global – but national and regional intellectual property frameworks have yet not caught up with the full range of cross-border content movement enabled by today’s technologies
 - Technology is making it easier to modify and redistribute content. The resulting complex chains of “derivative works” provide increased opportunities to capture creativity, but also create challenges to managing copyright.

[Innovation](#)

- [New engine sends shock waves through auto industry](#) – Researchers at Michigan State University have built a prototype gasoline engine that requires no transmission, crankshaft, pistons, valves, fuel compression, cooling systems or fluids. Their so-called Wave Disk Generator could

greatly improve the efficiency of gas-electric hybrid automobiles and potentially decrease auto emissions up to 90 percent when compared with conventional combustion engines.

- [Relentless And Disruptive Innovation Will Shortly Affect US Electric Utilities](#) – The Edison Electric Institute recently released a report entitled Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Electric Business. The report highlights some of the trends likely to affect U.S. electric utilities in the near future.

[Machine Learning](#)

- [The Part Of The Internet You Don't See Lets Machines Talk To Each Other—And Will Change The World](#) – The “industrial Internet,” which connects things like cars and power plants and medical devices, is going to be making more and more of an impact in our day-to-day lives--and you might not even notice it happening.

[Manufacturing](#)

- [Need Ships? Try a 3-D Printed Navy](#) – If two junior Navy officers have their way, the warships of the future will be floating factories that create everything from food to robots and spare parts — all thanks to 3-D printers. Shipyards will use them on a vast scale. And when the ships need more raw materials, they’ll link up with “biomining” ships that harvest raw materials from the sea.
- [4D-printing: from self-assembling chairs to cancer-fighting robots](#) – One day in the not-too-distant future, you will be able to buy a chair from Ikea, bring it home and watch it assemble itself in front of your eyes. In this same future world, if you are diagnosed with cancer, you might be injected with nano-robots that will track down and selectively kill the cancerous cells. You will feel nothing but mildly feverish in the process.
- [Matterform's Desktop 3D Scanner is Cheaper than a Tablet](#) – Tech lovers have

already been 3D printing everything from ornaments to their own faces with small desktop 3D printers. But now the technology is even more accessible, as low-cost 3D scanners make their way to the market. MakerBot says it has a 3D scanner in the works, but Canadian company Matterform is beating them to the punch, already offering consumers the lightweight Photon 3D scanner at a price that's cheaper than a tablet.

- [3D printer makes tiniest human liver ever](#) – Lab-grown livers have come a step closer to reality thanks to a 3D printer loaded with cells (see video above). Created by Organovo in San Diego, California, future versions of the system could produce chunks of liver for transplant. The mini-livers that Organovo made are just half a millimetre deep and 4 millimetres across but can perform most functions of the real thing.

Medical

- [Device Finds Stray Cancer Cells in Patients' Blood](#) – Doctors typically diagnose cancer via a biopsy, which can be invasive and expensive. A better way to diagnose the disease would be to detect telltale tumor cells floating in the bloodstream, but such a test has proved difficult to develop because stray cancer cells are rare, and it's difficult to separate them from the mélange of cells in circulation. Now researchers say they've built a microfluidic device that can quickly grab nearly any type of tumor cell, an advance that may one day lead to simple blood tests for detecting or tracking cancer.
- ['God particle' scientists come up with cancer-blasting beam as an alternative for debilitating radiotherapy](#) – The scientists who discovered the 'God particle' – said to be the building block of the universe – could revolutionise cancer treatment for tens of thousands of patients. The method, which treats tumours with high-powered beams of positively charged particles, is more effective than traditional radiotherapy and leaves healthy tissue undamaged.

Military

- [Smaller pixels, smaller thermal cameras for warfighters](#) – Smaller cameras will benefit soldiers in the field.

MISC

- [EmTech 2012 ON-DEMAND VIDEO REPLAYS](#) – Links to replays of the fascinating presentations from the Emerging Technology Conference at MIT.
- [10 Breakthrough Technologies 2013](#) – Ten of the most fascinating technologies are outlined and explained. These technologies will have a major impact during 2013.
- [Distributed creativity of the Electric Sheep](#) – Scott Draves is the inventor of Fractal Flames and the leader of the distributed computing project Electric Sheep. He also invented patch-based texture synthesis and published the first implementation of this class of algorithms.
- [Physicists believe it's possible to build a perpetual motion machine](#) – A prominent physicist has just announced that he's developed a proof for "time crystals" that can move thanks to a break in the symmetry of time. And now he's about to test his proof in the real world.

Nanotechnology

- [Nanotechnology reverses rusting just by turning on a bright light](#) – Wouldn't it be convenient if you could reverse the rusting of your car by shining a bright light on it? It turns out that this concept works for undoing oxidation on copper nanoparticles, and it could lead to an environmentally friendly production process for an important industrial chemical, engineers have discovered.

Quantum Computing

- [Diamond shows promise for a quantum Internet](#) – Today's Internet runs on linked silicon chips, but a future quantum version might be built from diamond crystals. Physicists report in *Nature* that they have

entangled information kept in pieces of diamond 3 metres apart, so that measuring the state of one quantum bit (qubit) instantly fixes the state of the other - a step necessary for exchanging quantum information over large distances.

Robots

- [Johns Hopkins Team Deploys Hundreds of Tiny Untethered Surgical Tools in First Animal Biopsies](#) – By using swarms of untethered grippers, each as small as a speck of dust, Johns Hopkins engineers and physicians say they have devised a new way to perform biopsies that could provide a more effective way to access narrow conduits in the body as well as find early signs of cancer or other diseases.
- [Knowing the unknown](#) – If robots are ever going to move effectively around our constantly changing homes or workspaces performing such complex tasks, they will need to be more aware of their own limitations, according to researchers at MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL).
- [Robotic jellyfish could one day patrol oceans, clean oil spills, and detect pollutants](#) – Virginia Tech College of Engineering researchers are working on a multi-university, nationwide project for the U.S. Navy that one day will put life-like autonomous robot jellyfish in waters around the world.
- [Robots Redefining the Global Workforce](#) – Rodney Brooks discusses the launch of his new industrial robot, Baxter.
- [Robots at Work: Toward a Smarter Factory](#) – Many fear a robot revolution could put humans out of work. This discussion illustrates how that will impact the workforce.

Sensors

- [Sensory helmet could mean firefighters are not left in the dark](#) – A specially-adapted 'tactile helmet', developed by researchers at

the University of Sheffield, could provide fire-fighters operating in challenging conditions with vital clues about their surroundings. The helmet is fitted with a number of ultrasound sensors that are used to detect the distances between the helmet and nearby walls or other obstacles. These signals are transmitted to vibration pads that are attached to the inside of the helmet, touching the wearer's forehead. Rescue workers, such as fire-fighters, who might be working in dark conditions or in buildings filled with smoke, will be able to use the signals to find walls and other obstacles that could help guide them through unfamiliar environments.

- [Edible electronic medical devices could be swallowed like regular pills](#) – Over the past several years, scientists have developed so-called "camera pills," that can be swallowed by patients and then transmit video from within their bodies. While such non-digestible gadgets could serve as an invaluable means of imaging, researchers at Carnegie Mellon University are now looking into tiny electronic medical devices that could be swallowed and partially digested, providing non-invasive treatment in the process.

Virtual/Augmented Reality

- [Oculus Rift Integration Coming to Second Life](#) – Linden Lab intends to integrate the Oculus Rift virtual reality headset with Second Life, company spokesman Peter Gray just confirmed with me. "Yes," he replied, when I asked, "we plan to strongly support Oculus Rift. That means code, client, and server-side, to make the Oculus Rift experience excellent in Second Life." That's excellent news, because like I said last week, the Oculus could become Second Life's killer app.

Wearable Computers

- [Where Mobile Payment and Wearable Technologies Meet](#) – For Jack Dorsey, chief executive of the mobile payment system Square and a co-founder of Twitter, wearable technology may naturally intersect with the mobile payment industry. Square already

produces a mobile wallet technology that allows users to pay for purchases with their smartphones or iPads. Users simply download the Square Wallet application to their phones, link the app to their credit or debit cards, and then use the app to pay at the register. The app produces the authorized user's photo at the point of sale, so merchants can be sure the transaction is secure.

- [How smart are your clothes?](#) – From corsets to caftans, we have seen dramatic changes in popular style over the past 100 years. New research from Concordia University now brings the future of fashion into focus by taking a closer look at the next quantum leap in textile design: computerized fabrics that change their colour and their shape in response to movement.