Doctoral student Alan Rorie aims to instil 'a sense of wonder and whimsy' through his machine art.

HACKING

Crafters tinker with technology

Krista Zala

A new crafts movement is afoot. Growing numbers of tinkerers are creating custom machines following their own aesthetics. Dabbling with electronics, electrolysis and etching, these contraption-hackers gleefully ignore warranties and dig in, here overhauling a lap-top to achieve a century-old look, or there wiring a pair of contemporary headphones into a gutted antique pair.

Capturing the spirit of the emerging culture, the O'Reilly Emerging Technology Conference that took place this week in San Diego, California, ran sessions on how to make aerial drones and on hacking — beyond gadgets to the body, brain and food. In May, just south of San Francisco, the third annual Maker Faire will bring together craft geeks usually united in cyberspace for a weekend of workshops and tip-swapping.

One subset of these twenty-first century creators looks back to an era when handcrafters designed everyday tools with an elegant flourish. For example, using old gas-lamp arms and chime levers scrounged from a grandfather clock, Sean Slattery, the computer guy at a chemical research and development company in Burlington, Massachusetts, retooled his keyboard and flat-screen monitor to imbue it with vintage Victorian style. "Steampunk is a general rejection of the sameness that globalization is bringing to the world," says Slattery (or Hieronymus Isambard Jake von Slatt, as he is known in steampunk circles).

"Steampunk is to science what civil war re-enactions are to history," Slattery explains. The people involved — many of them scientists and engineers — are interested in learning about the history of science. They do so by re-creation,

converting electrical lamps to kerosene or fashioning telegraph sounders to tap out web content updates. Their engagement thus becomes personal, tactile and satisfying.

The trend emerged in the 1970s and 1980s as a subgenre of science fiction, which set Victorian characters amid today's technology or in a parallel future universe, where analogue triumphed over digital and the airship prevailed over the aeroplane. The fantastical sensibilities spread from literature into film and video games across Europe, Japan and the United States. The past few years have even seen steampunk pervade fashion and music. The style plays with the parallels between the Industrial Revolution and the Information Revolution — both eras of intense technological and social change. Now part of the wider culture of uploading, downloading, copying, pasting, swapping and re-ordering the world,

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globe, the hemispheres of which spin in opposing directions around a system of gears.

"I want to create interactive art that communicates science to people," says Rorie. Scientists physically experience the world to

gain an understanding of systems, he explains, but share only the facts that they find, which deprives their audience of the feel of research. He aims to instill "a sense of wonder and whimsy" with his artwork. His next project is an interactive neuron to teach people about receptive fields.

Krista Zala is a science writer based in Victoria, Canada.

HACKING

Home cooking with a twist

Jascha Hoffman

"I think of cooking as hacking," says Californian computer programmer Marc Powell, who led a 'Kitchen Hack Lab' demonstration at the O'Reilly Emerging Technology Conference in San Diego this week.

In the kitchen, we're all amateur chemists. Protein, carbohydrate, fat and water react to changes in pressure and temperature during

steampunk applies the philosophy of open-source software to hardware.

Aficionados combine an appreciation of good simple engineering, as embodied by the steam engine, with the 'do it your way' ethos of punk. Steampunk aesthetics, in contrast with the hidden mechanisms and functions of today's gadgets, expose and celebrate intricate machine workings. That said, the builders happily draft plans using modern software and materials.

Tinkering has always been a key way into science. Inquisitive minds bent on learning how the world works have long gone at it with a screwdriver first. Now teachers are enhancing their lessons on electrolysis using Slattery's etchings on confectionery tins and iPods.

For purists, "it's not really steampunk unless it has a steam engine attached to it," says Sean Orlando, artistic director of the Steampunk Tree House, the interactive sculpture installed last year at the Burning Man arts festival in Nevada. The nine-metre-tall tree fashioned from steel pipes, I-beams and an 8,000-kilogram steam engine took five hours to generate the power to run a steam organ; its lights were powered by a solar array.

In San Francisco, the eighth annual Edwardian Ball Weekend this January showcased boiler-powered antique engines. A horizontal engine drove a novelty 'time machine' designed and built by Alan Rorie, a neurobiology doctoral student at Stanford University, California. The 'dihemispheric chronaether agitator' (pictured) is a polished copper sphere, the size of a desk

globe, the hemispheres of which spin in opposing directions around a system of gears.

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liver and savoury bubble tea with squid ink tapioca pearls (<http://up13.org>).

A chemical logic underpins Powell's odd blend of ingredients: one batch of gumdrops used raspberry, rum and ant venom because they all contain derivatives of formic acid, which has a strong, tangy taste.

After the dot-com bust, Powell trained in the kitchen of Heston Blumenthal, head chef of The Fat Duck in Berkshire, UK. Blumenthal founded his own research laboratory to refine such culinary techniques as sous vide, or slow cooking in vacuum-sealed bags. In recent years, a handful of molecular chefs — including Ferrán Adrià at Spain's El Bulli and Homaru Cantu at Moto in Chicago, Illinois — have used liquid

nitrogen, lasers and inkjet printers to expand the range of possible flavours and textures.

Ultramodern kitchen experimentation has largely bypassed the amateur because of the high cost of equipment, such as rotary evaporators or an 'anti-griddle' that chills to -34°C . But vacuum-sealers and smoking guns are relatively cheap and, as food scientists such as Harold McGee and Hervé This have shown, there is also room for innovation using standard ingredients and appliances.

What sets Powell apart is his home-grown approach. He invites strangers to bring their own ingredients into his kitchen and hack alongside him. "I think food cooked at home is always better than what's cooked

in a restaurant," he says.

Plus, unlike many restaurant chefs who keep their recipes secret, Powell encourages 'open-source recipe development' (<http://wiki.foodhacking.com>). For when inspiration fails, his website program (<http://deliciouscorpse.com>) generates random recipes — such as 'grub-injected wasp caviar with salt-baked spider bun' — that can be tailored to the contents of your larder.

It remains to be seen whether the invention of such new dishes, as the French epicure Jean-Anthelme Brillat-Savarin wrote in 1825, "does more for human happiness than the discovery of a new star".

Jascha Hoffman is a writer based in New York.

HACKING

Toys, bugs and rock 'n' roll

Joanne Baker

"I like listening to insects," says Thomas Truax. A nominee for Britain's 2008 Indy Music Award for best live act, Truax is making a name for himself by building his own instruments from gramophone horns and pull-string toys. He sings about ants, the ozone layer, the Internet and dogs howling at the Moon.

Truax grew up in Colorado and became fascinated with insect sounds. "I was at a camp in the jungle in Mexico and I heard this insect that sounded like a Volkswagen that couldn't get started," he says. Truax explains how he also records bat chirps near his home in London, editing them to make sample loops.

One of Truax's songs tells the story of an injured butterfly that has escaped being pinned to a specimen board by an entomologist. To evoke the sound of its wings, he plays the guitar with a hand-held rotary fan, creating fluttering arpeggios. To avoid working with difficult musicians, Truax builds and plays his own instruments, such as a drum machine crafted from spinning fly-wheels and tiny cymbals.

Other instruments are created from reclaimed junk. Truax is inspired by toys and simple experiments, such as the two-way 'telephones' kids make from string and paper cups. On stage, he sings down a gramophone horn that is wired up with a Slinky to distort his voice, or he amplifies the percussion of clockwork and the vibrations of a single string held taut by an audience member. "I want to make people think about what music is," he says.

"We are at a point in history where computers can do so much but people are losing touch with tactile things," he says. If electronic instruments and digital editing are depersonalizing sound, Truax is making his own noise.

Joanne Baker is *Nature's* Books & Arts editor.

Thomas Truax's single *Stranger On A Train* is out on SL Records (UK) on 31 March, and will be online from 14 April (www.thomastruax.com).

Thomas Truax crafts instruments from junk to create a new sound inspired by insect noises.

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