Reifenhäuser
The Extrusioneers

Cover photo:
The electron micrograph of Nylon geotextile at a magnification level of x66. The material consists of nonwoven fibers that are thermally bonded in “melting spots.” It is being used in civil engineering applications with a requirement of earth stabilization.

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pure

New Perspectives **by Reifenhäuser**

Networking for better business

Connect to innovation

Close relations:
Relate with your prospects for mutual benefits.

Bold creations:
These young innovators may change the world.

→ New thinking: **WORLD-CHANGING TECHNOLOGY**

Innovators young and bold

These young innovators and their groundbreaking technologies could change the world. PURE speaks to seven people behind six exciting developments – and finds out what intelligent, creative thinking can achieve.

By Stuart Braun

As companies search for that elusive point of difference in ever-more-competitive markets, radical innovation is increasingly fundamental to the sustainable success of any enterprise. And, in the 21st century, technological innovation has also become a source of hope for the pressing social and environmental problems of the planet, a solution to dilemmas that could have an irreversible impact on peoples and markets.

As technological innovation has a more profound potential to shape our future, especially in the digital age, young people are learning to apply technology rapidly, effectively, sustainably and responsibly to create new market opportunities and enhance quality of life for people across the planet.

Initiatives like the Europe Young Innovators Forum ("a community of young innovators and experts that believe in taking risks and the value of shared ideas"), or *Technology Review* magazine's annual selection of "35 innovators under 35" (this year's "revolutionary innovators" were chosen for their ability to influence human affairs in the fields of computing, energy and biomedicine), typify the growing culture of future- and forward-thinking innovation among the world's best young minds.

PURE is proud to present seven exciting young innovators who are striving to responsibly shape the future and change the world through their novel applications of everything from simple mobile phone technologies to the latest 3D GPS systems.

Mapping the labyrinth

Georg Schroth – NAVVIS

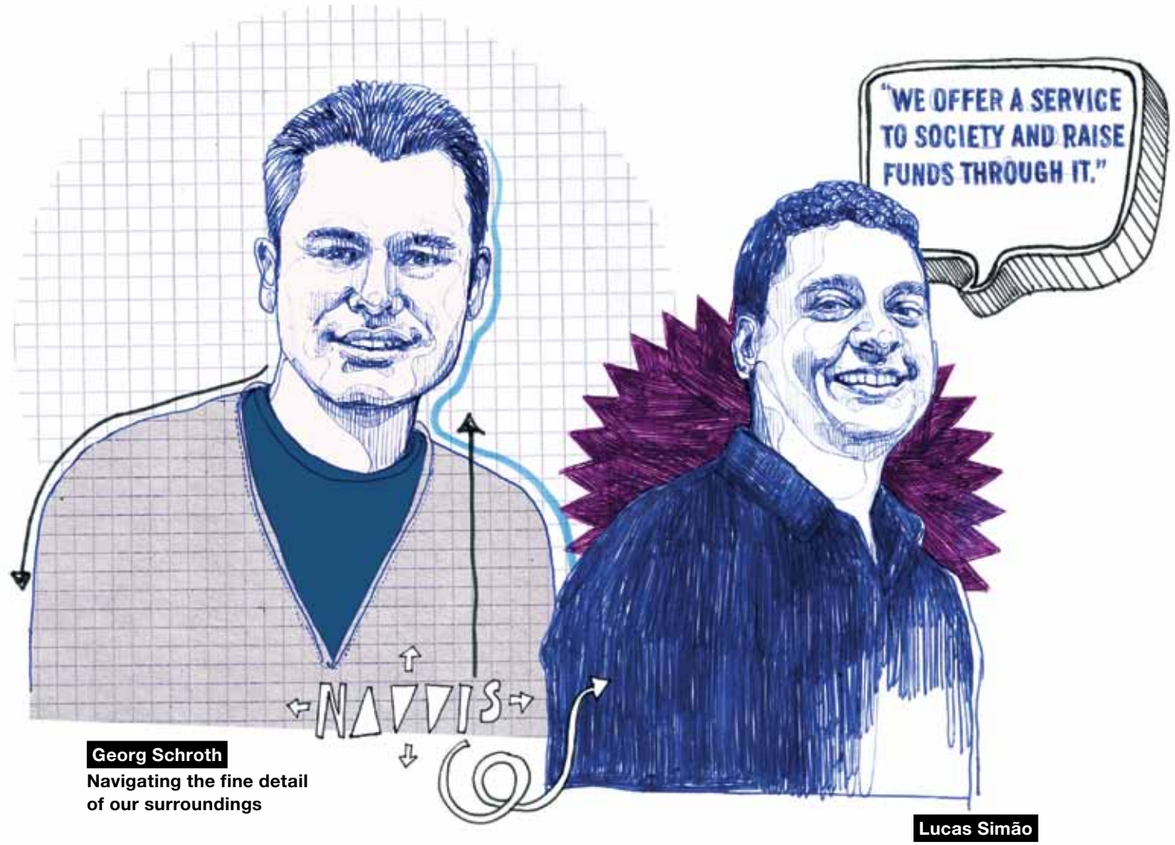
GPS is a great way to get from point A to B, but what happens when you want to find your way through complex indoor environments? Georg Schroth is a 29-year-old PhD candidate at the Technical University of Munich who is boldly trying to revolutionize the way we use digital mapping, especially on our smartphones. Along with fellow researchers Robert Huitl and Sebastian Hilsenbeck, Schroth has created an exciting new 3D mapping technology called NAVVIS (navigation based on visual information for extended perception of the environment) that will lead people to ATMs in shopping malls or favorite artworks in museums.

When Schroth was a visiting researcher at the Stanford GPS Lab in 2007, he soon realized he could get a lot more out of GPS technology. "While outdoors GPS guides us through our daily life, indoors we do not receive much help from our powerful smartphones, even for our most basic needs," he says.

Schroth wondered how this problem could be solved. In short, he and his team created a mobile visual indoor "localization" system that, once the user takes a photo of his or her location, builds a 3D map of the wider area based on a database of images.

With a working prototype ready, Schroth and the NAVVIS team are currently working on the user interface for mobile devices and for location-based service providers like Google Maps. Like many young innovators, Schroth is also looking for more investors.

"[NAVVIS goes] far beyond navigation and vanity searches by integrating external information," Schroth says of a technology aimed at enhancing our world. "Using the smartphone as a virtual tourist guide, the museum visit could become an entirely different experience. Visitors to the Louvre would not only be able to locate the Mona Lisa, but also view information about the painting or find directions to other works by da Vinci."



Georg Schroth
Navigating the fine detail of our surroundings

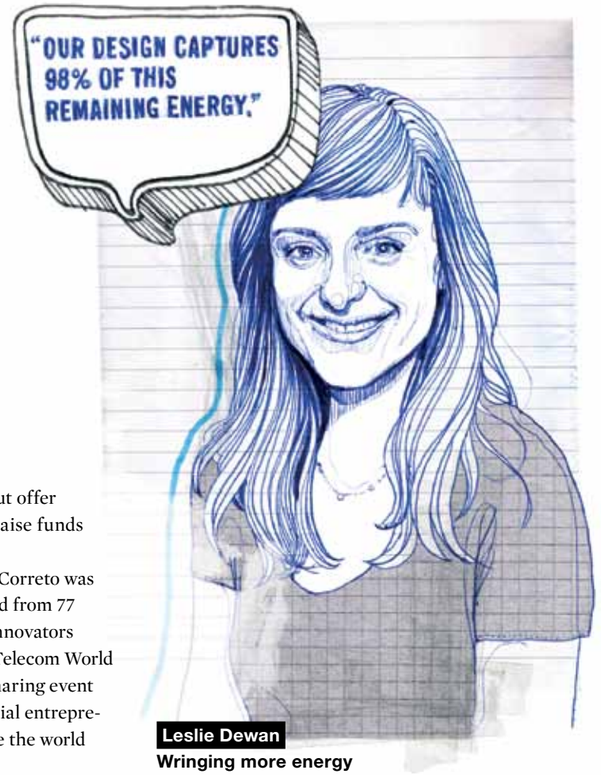
Lucas Simão
Clever e-waste recycling with manifold benefits

Illustrations: Silke Werzinger

Digital sustainability

Lucas Simão – Descarte Correto

Digital technology is an increasingly vital part of our lives, yet while computers are often thrown on the scrapheap



Leslie Dewan
Wringing more energy from nuclear waste

after a couple of years, many in the world still struggle to access such basic technology. Lucas Simão, a 25-year-old Brazilian computer technician from the Nokia Education Foundation, has ingeniously tackled the problem of digital "exclusion" via the collection, refurbishment and recycling of electronic waste.

Simão co-founded Descarte Correto in 2010 and thus has instituted a rewards incentive scheme to encourage business and consumers to donate e-waste that is turned into vital digital resources to aid education and employment in isolated regions like the Amazon. This leads to technological, environmental and social sustainability.

While e-waste recycling is not entirely new, Simão had the idea of creating a financially self-sustaining cycle that solves the problem of digital exclusion through commercially viable electronic waste management. After many digital resource centers in the Amazon region lost funding following the global financial crisis, Simão aimed at maintaining digital resources among low-income communities by taking over solid waste recycling responsibility from manufacturers, distributors and consumers.

"We saw a great opportunity to become an agent of the process, targeting a future that will not depend on financial donations but offer a service to society and raise funds through it," says Simão.

Simão and Descarte Correto was one of 12 finalists selected from 77 countries in the Young Innovators Competition at the ITU Telecom World 2012, a key knowledge-sharing event that celebrates young social entrepreneurs who seek to change the world with technology.

This young innovator is also looking to expand to other states and countries in a bid to spread the twin mantra of digital access and global recycling.

Powered by waste

Leslie Dewan – Transatomic

She may be a twenty-something yet to complete her graduate studies in Nuclear Science and Engineering at MIT (Massachusetts Institute of Technology), but Leslie Dewan is already formulating a technological innovation that will change the world. Her plan: to power the entire US for the next century with zero carbon emissions – using nuclear waste that would normally stay toxic for thousands of years.

With fellow PhD candidate at MIT Mark Massie, Dewan founded Transatomic in 2010 with an eye towards converting high-level nuclear waste into $7.1 trillion worth of electricity. At full deployment, Transatomic's so-called WAMSR reactors could use existing stockpiles of nuclear waste to satisfy the world's electricity needs until 2083.

Dewan could have taken the easy option to become a research scientist, and applied for a regular teaching or research job. But instead she took a risk and formed a start-up that will transform her own research principles into a technological game-changer in the vital fields of energy and environment.

While the WAMSR reactor greatly reduces the life span of radioactive waste from hundreds of thousands to a few hundred years, thereby decreasing the need for permanent waste repositories, it is also highly efficient. "Instead of using solid fuel pins, we dissolve the nuclear waste into a molten salt," says Dewan.

When fuel is a suspended liquid it can stay in the reactor longer and more of its energy is captured. "Conventional nuclear reactors can utilize only about 3 percent of the potential fission energy in a given amount of uranium before it has to be removed from the reactor. Our design captures 98 percent of this remaining energy."

Dewan and the Transatomic team are planning to build a prototype reactor in 5 years and to commercialize the technology in 15 years.

Jackie Stenson
Putting better technology within customer reach ...

Diana Jue
...improving the lives of those who buy and sell

Essential technology for all

Jackie Stenson and Diana Jue – Essmart

Technological innovation has the potential to benefit all, but people across the world have limited access to the products that could change their lives. With this in mind, American graduate students Jackie Stenson and Diana Jue founded Essmart, a process innovation created to channel life-improving technologies from manufacturers to people who can benefit from them. Stenson, a mechanical engineer who studied at Harvard and Cambridge, and Jue, an international development graduate from MIT, founded Essmart in 2012 as a vehicle to improve technology dissemination for low-income households in the developing world, especially India. The goal is simple: to bring the essential technologies like clean, efficient LED lights to local shops that have only ever supplied dirty, inefficient kerosene lanterns. If successful, the project could help 10,000 small retail shop owners in India gain knowledge about new technologies and a higher-margin revenue stream. Essmart won the 2012 Dell Social Innovation Challenge for its bold mission to catalog and distribute high-quality technologies in local shops that constitute 90 percent of India's annual retail spending. "[And yet] these shops don't sell essential technologies because they don't know about them, where to get them, or how to service them," says Jue. As Essmart looks to expand to Africa and Latin America, it really will have the power to change the world. "We can revolutionize distribution in emerging markets like Sears-Roebuck revolutionized distribution in America," says Jue. The benefits are threefold. "We encourage suppliers to design better, more affordable technologies; boost local shop owners' income; and offer households life-improving products."

Illustrations: Silke Werzinger

Monika Kavaliauske
Cleaning up oil pollution – without toxic chemicals

Good soil from bad oil

Monika Kavaliauske – Optisoil Clean

As the massive BP oil spill in the Gulf of Mexico confirmed, crude oil can be extremely damaging to the environment. But so far, repairing contaminated ground requires the use of equally toxic chemicals. Monika Kavaliauske, a 27-year-old International Business graduate at Vilnius University whose career has been focused on biotechnology, biopharma and environmental protection, has been working to solve this planet-wide problem with a team of scientists at Lithuanian company Biocentras. The outcome is the revolutionary technology known as Optisoil Clean, a biological technique that restores oil-contaminated soil to a state suitable for plant growth.

The method involves washing soil using a water solution of biosurfactant to separate the oil from the sludge – both the soil and the collected oil are then ready for re-use. Kavaliauske says the technology has already been used to successfully clean over 22,000 tons of soil without the need for chemicals or genetically modified technologies.

Optisoil Clean won the EUREKA Innovation Award in 2011, an EU-funded scheme that rewards outstanding technological and commercially viable projects that maintain Europe's competitive edge while having a positive societal impact. EUREKA acknowledged Optisoil Clean's potential far-reaching applications in a world that widely suffers from oil contamination.

So far only tested in Europe, Kavaliauske is looking to apply the technology farther afield, particularly in warmer oil-producing regions. "We have no clients in the Middle East and are actively looking for them. There are potential applications for most of the world, and we are keen to develop them further," she says.

Jamila Abass
Putting profits in the hands of rural farmers

Illustrations: Silke Werzinger

Making farming pay

Jamila Abass – M-Farm

As a young girl growing up on a farm in arid northeastern Kenya, Jamila Abass long realized that among the near 80 percent of Kenya's population relying on agriculture for most of their income, many struggle merely because they lack access to vital information. "This results in exploitation by the middlemen who take advantage of the lack of transparency in the market," she says.

Having worked as a software engineer in companies like African Virtual University, Abass realized the problem could be solved with a simple mobile phone. So in 2010, she quit her job with the Kenya Medical Research Institute to co-found the all-female tech company M-Farm, a mobile app that allows farmers to get real-time retail prices for their products, buy farm inputs directly from the manufacturers and find buyers for their produce, all without parasitic middlemen.

"The M-Farm system provides farmers a group selling service where they can connect with other farmers from the neighborhood to jointly market crops in greater volume, helping rural farmers access large-scale local and international markets," Abass explains. "Farmers often need to have large quantities of produce available in a short time frame in order to sell to exporters and large-scale retailers. Farmers also get connected to suppliers and, through collective buying power, get significant discounts on farming inputs such as seeds and fertilizer."

M-farm partnered with grassroots NGOs to access 7,000 farmers in 2012 that are now paid-up subscribers to the service. "Most of the farmers we are working with doubled their profits and have direct and stable markets with buyers who are also M-Farm clients," says Abass.

With an application that could change the world for millions of farmers and their families, Abass was crowned a PopTech Social Innovation Fellow in 2012, a program designed to equip groundbreaking young innovators with the tools to scale their impacts to new heights.

Changing the world

Across the planet, visionary young innovators are hard at work incubating new approaches to the world's toughest challenges via technology. "Through innovation and action, young people are addressing the world's most pressing human issues by turning their passion into real solutions," said Suzi Sosa, Executive Director of the Dell Social Innovation Challenge, when Essmart won the award in 2012. As bold young world-changers utilize technology to shape solutions for markets, communities and the environment, they will continue to positively drive the future for all. <

Read more

Websites

- **Innovators under 35:** *www2.technologyreview.com/tr35/*
- **Open innovation platform:** *www.innocentive.com*
- **Innovation Union:** *http://ec.europa.eu/research/innovation-union/index_en.cfm*

Books

- ***Managing Joint Innovation:*** *How to Balance Trust and Control in Strategic Alliances.* By Francis Bidault. (ISBN: 978-0230279971)
- ***Managing Global Innovation:*** *Frameworks for Integrating Capabilities around the World.* By Y.L. Doz and K. Wilson. (ISBN: 978-1422125892)
- ***Creating Innovators:*** *The Making of Young People who Will Change the World.* By Tony Wagner. (ISBN: 978-1451611496)