TEN WEEKS TO SAVE THE WORLD

Singularity University tries to breed world leaders by immersing students in futuristic concepts. **Nicola Jones** finds it a heady mix of grand claims, brilliant minds and cool gadgets.

A laser runs across Alison Lewis's face, scanning her features into a laptop in a room filled with Lego robots and other high-tech toys. Her image appears on the screen, and after a few tweaks it is ready to be printed, in three dimensions, by the minibar-sized machine in the corner. This blows the minds of many of the students in the room. More importantly, it gets them thinking about the possibilities of tomorrow's technologies, and how they can be used to improve the future. Last year, students inspired by such demonstrations came up with the idea of printing low-cost housing in the developing world. One of them left his PhD and moved to the Bay Area of California to move that project forwards.

Singularity University in California, known as SU by its alumni, isn't really a university — it doesn't award degrees or grant course credits. Instead, it is an intense, ten-week, exclusive summer school for overachieving graduate-level students from the worlds of academia and business — including, this year, the Massachusetts Institute of Technology's youngest-ever graduate student and several multimillionaires. Its mission is to educate and inspire future leaders to use emerging technologies to solve the globe's biggest problems, from poverty to ill health to resource depletion. When I drop by for a few days in August, the place feels like a think tank mashed with a geek adventure camp and a business-networking cocktail party.

The experience doesn't come cheap. SU students pay US\$25,000 for ten weeks' tuition and board, which would buy a full year, or even two, at most US universities. But the students are sparking ideas, forging relationships and brokering deals that will last a lifetime and might just save the world — or make the students

some money while trying.

The project was co-founded by Peter Diamandis, whose more famous brainchild, the X PRIZE Foundation, hands out multimillion-dollar prizes for things such as launching the first manned private spaceflight. Diamandis was inspired by futurist Raymond Kurzweil's 2005 book *The Singularity is Near*, which describes how 'accelerating technologies' are driving exponential improvements in humanity's ability to live ever longer and better. Kurzweil sees this leading to 'the singularity': a moment when computers will be one billion times more powerful than all human intelligence today, triggering a profound transformation in human capability and causing the Universe to 'wake up' — sometime around 2045.

Predictions like that make most scientists squirm (and most SU students, too, who are quick to tell me they aren't 'singulartarians' like Kurzweil). But the notion of technological acceleration struck Diamandis as the right way to look at the world — and to frame a school. Diamandis had previously founded another uber-summer-camp, the International Space University in Strasbourg, France, which seeks to train the future leaders of space agencies around the world. SU was to be similarly high-powered, but broader in scope.

In 2008, a group including Diamandis and Kurzweil had a meeting to explore the idea, and promptly hired Salim Ismail, the former head of Yahoo's 'ideas factory', as executive director. By summer 2009, they had their first class of 40 students.

What they formed is a programme that effectively turns normal academia on its head. "The education system for the past 200 years has been about really drilling down into a tiny subject," says Diamandis. "Here we try and flip it." Instead of 'deep diving' into a single subject, students broaden their horizons. Instead of learning the history of their speciality, they imagine the future of the entire world.

The result has made some waves, in part

Scenes from Singularity University, from the top: lectures with techno-celebrities; programme logo; students on a field trip; founder Peter Diamandis; results from a brainstorming session; and the school's home at NASA's Ames Research Center.

because of the school's unique mandate, provocative name and influential connections — Google, for one, donated \$1 million to help launch SU. At SU's opening last year, Larry Page, who co-designed the software behind Google's search engine, said: "If I was a student, this is where I would want to be." And the programme has caught the attention of Washington. Last month, Ismail spoke on behalf of SU at a US Agency for International Development state dinner hosted by US secretary of state Hilary Clinton.

Among academics, impressions are more mixed. Andrew Maynard, director of the University of Michigan Risk Science Center in Ann Arbor, who isn't involved with the school, says he has "reservations about a programme that runs the risk of running close to pseudoscience at times", given some of the people involved with the project. But at the same time, he says, people probably need to break out of the usual conservatism of academia to solve the world's most pressing problems. "Maybe there is a need for opportunities that allow scientists and engineers to let their imaginations run a little wild."

Post-it visions

SU's format is simple. It starts with five weeks of lectures and field trips that introduce students to the cutting edge in ten areas, from nanotechnology to biotechnology (see 'Curriculum of the future?'). This year's trips included a jaunt to the robotics research lab Willow Garage in Menlo Park, and the Tesla electric car company in Palo Alto, both in California. Students got a chance to test the da Vinci robotic surgical system — a device that lets doctors use mechanical arms for precision surgeries — and ride one of the world's top flight simulators at the NASA Ames Research Center in Mountain View, California — the campus on which SU is housed.

In the final five weeks of the programme, the students organize themselves into groups to tackle one of five areas: water, food, energy, space and 'upcycle' (the idea of turning rubbish into something useful). Their mission is to 'harness the power of exponential technologies' and come up with a plan — commercial or non-profit — that will improve the lives of 1 billion people within a decade.

By week seven, when I visit, the students are burning the midnight oil, digesting what they have learned and developing their projects. A few dozen congregate in the university's main gathering place, which is plastered with post-it notes mapping their predicted vision of the future (three-dimensional printing will be

available at Kinkos photocopy centres, one note says, in 3–5 years). Diamandis rubs his hands together and orders a coffee to keep him going, not that it looks as if he needs it. In one room, students from Ethiopia to Romania grapple with the democratization of energy; in another, a Chilean struggles to get drinking water to the slums. When discussion turns to better ways of distributing information, Diamandis says: "If you want to talk to the people who created Google Earth — a platform like that — I can hook you up." The students simply nod, now used to such extraordinary connections.

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The spread of nationalities among the students is impressive. Some 1,600 people applied for this year's summer camp, from 85 countries. Applicants were judged on their academic strength, their entrepreneurial or leadership expertise, and a dedication to solving humanity's grand challenges. Diamandis and Ismail made the final selections, aiming for 25–30% women, 20–25% from the developing world, and a good spread of expertise and geography. The result is 78 students from 35 countries.

One of them is David Dalrymple. Now 19, Dalrymple was the youngest person to start a graduate programme at the Massachusetts Institute of Technology in Cambridge when he began there five years ago. For his PhD, he is inventing a programming language better suited to artificial intelligence. Dalrymple says that SU "follows the first law of education, which is that the people are more interesting than the programme". Lewis, who had her face

scanned, is a designer whose 2008 book *Switch Craft* combines electronics and sewing to make technology more accessible. At 22, Londoner Zain Jaffer has already founded a long list of start-up companies. And Santiago Bilinkis had made millions by the age of 35 by founding Officenet — Argentina's version of the US office-supply chain Staples — and then selling it to Staples. "When I was young, I wanted to get rich and be a mad scientist. I'm here to fulfil my plan," he says.

The result, if nothing else, has the makings of a good dinner party. But SU's organizers hope to produce more than that: tomorrow's presidents, Nobel prizewinners and top executives. "We're essentially creating a primordial ooze of future leadership," says Ismail.

Many of these students can't afford the \$25,000 price tag; more than half of them got a full or partial scholarship from SU or other donors. The millionaires, naturally, paid for themselves. In total, the non-profit University pulls in about \$1.1 million a year from students and some donations, says Ismail. But the rent in the NASA facility, along with nine full-time staff salaries and the burden of reinventing the curriculum afresh every year, soaks up about \$2.5 million. The organization covers much of the shortfall through the proceeds of its executive programmes — in which 45 participants pay \$15,000 for a nine-day session, or \$6,500 for four days, in the autumn.

Technotopia

Over the summer, this year's students have heard from 160 speakers, including Linda Avey, co-founder of the personal genetics company 23andMe; Dean Kamen, inventor of the Segway personal transporter and brain-controlled prosthetic limbs; and Ralph Merkle, a nanotechnology and quantum-computing guru. The star power of the advisers seems brightest in the areas of information technologies: they include Vint Cerf, one of the fathers of the Internet, and John Gage, former chief researcher at Sun Microsystems.

In ten weeks, students can get only a broad overview of topics through the barrage of lectures. But they also get on-demand face-time with people who know what's what in the hottest technologies. "A lot of people come here with a mission, and meet the one person in the world who could answer their question," says Tony Lyu, a student from South Korea. Lyu, who studied electrical engineering and has worked with the United Nations Office for Outer Space Affairs, isn't exactly without connections. But, he says, "I wasn't part of the inner circle before. I am now."