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SOLUTIONS Huck Fairman

Student living the Full life

The beautiful name, Eden Full, belongs not to a heroine in a romantic novel, but to a startlingly impressive Princeton University junior majoring in mechanical engineering. Her story might, however, with its many interesting projects, inventions, awards and travels, all achieved by the august age of 22, inspire a novel.

Born and raised in Calgary, Alberta, speaking Cantonese at home with her parents originally from Vietnam, Full considers herself Chinese-Canadian. Recognizing, even before high school, that what interested her were ideas for projects, she conceived and realized a variety of them that would fill the resume of someone three times her age. At 10, she built a solar-powered toy car and compared its performance in different conditions. A year later she designed a maze to test the intelligence of different species of fish. At age 12, she tested more than 150 human subjects for memory retention. Presenting this research at the 2004 and 2005 Calgary Youth Science Fairs, she won the first of many medals.

In 2007, she began a series of experimental projects that would eventually lead to her ground-breaking invention, the SunSaluter. The first of these was modeling "tree morphology to determine the optimal arrangement for placing fixed solar panels to [maximize] energy collection." Later that year, she proposed a device that would assist individuals lacking depth perception and binocular vision. This device won her more awards, and evidenced an abiding interest in testing the performance of beings and devices, with an eye toward improvement.

The year 2008 saw the next step toward the SunSaluter in a proposal for a "a micro-tracking technique for solar panels." To evaluate its feasibility, she constructed a prototype, pulling together ideas from several sources, including ancient water clocks. With this experience, she was ready to construct a marketable edition consisting of a single solar panel and tracking device. But she found that by rotating the solar panel to follow the sun's arc, the SunSaluter could produce 40 percent more electricity than a stationary panel. The mechanism driving the tracking device is a simple water displacement system where water flows from a daily refillable pop-bottle reservoir through an adjustable valve.

At home in Calgary, she became so focused on this project that her parents let her skip school to work on it. And then, while displaying it at an international science fair, she was told by an Indonesian woman that her device could be extremely useful in rural villages. This, as Full puts it, lit up her own light. Rather than just another science project, her

invention could be used in the Developing World to power water purifiers, lights, radios, computers, or phones. Because the SunSaluter is simple to construct and maintain (it's made of bamboo and metal and costs about \$20), and requires no electricity, it can bring electricity to many who previously were not connected to a grid or could not afford to be. (According to Jigar Shah in his book "Creating Climate Wealth," one in five people on earth has no electricity.) With the SunSaluter, many people can now produce the electricity not only to purify water but to connect with the wider world. Full estimates that 5,000 to 6,000 people have benefited from it to date.

Somewhere in the middle of this evolving project, she formed a company, Roseicollis Technologies Inc., (from Eden's favorite species of lovebirds), to make and distribute SunSaluters, now offering them in nine countries from India to Malawi. In 2009, she also found time to graduate from high school, visit the Canadian Arctic to study climate change, and enroll at Princeton University.

There, she took a course on science, technology and African development from Professor Winston Soboyejo who served as her adviser as she worked to design sustainable metal buildings. In the summer of 2010, with support from Princeton's Grand Challenges program, she spent three weeks in Kenya where she saw firsthand how the work she was doing could change lives.

Back on campus, her wide-ranging interests had led her to become a coxswain for the women's lightweight crew, a position she defines as being "a small person who sits in the back of the boat, steering and executing the race plan." In the spring of her sophomore year, while coxing on Carnegie Lake, she received a call from California. Returning the call, she discovered she'd won a Thiel Fellowship, which offers a two-year stipend with no restrictions on how the money is used, beyond the requirement that a fellow suspend college for the period. She talked it over with her parents, who, having not attended college, were

anxious that she complete her schooling. For them, and to fulfill her own desire to gain a thorough education, she promised to return after the two years, which she has now done, approaching the end of her junior year.

The Thiel Fellowship enabled her to revisit Africa to further refine the SunSaluter in response to real-world testing and to expand her global connections necessary to distribute it. She also received other grants supporting her business efforts. But she has never confined her wide-ranging interests and abilities to one sphere. During her fellowship, she lived in Oakland, California with another Princeton inventor, Danielle Fong, together holding weekly dinners with other budding entrepreneurs, and she also traveled in Europe and coxed in regattas in Holland and England.

Back at Princeton, now class of 2015, with much broadening experience under her belt, she continues to oversee her company, which is expanding its product line to include more affordable tracking components and ones that are automatic, for larger or commercial installations. Roseicollis Technologies has also put together a team in Bangalore, India, to assemble SunSaluter units. And yet, despite the progress and expansion, this now-worldly college student is no less curious about how things work and is currently investigating fields new to her — electronics and programming.

Eager to share her story, she urges young people to: "Choose an unconventional life path. Take initiative. Reach out (for people like to help). Be aware of what one is doing, and think of the consequences." In her own life, she continues to pursue a path that is dedicated to learning, innovating and expanding her own work around ideas that matter.

Huck Fairman is a local writer who in the course of researching another project was confronted by the overwhelming evidence that we are changing the earth's environment. And that will affect life as we have known it. He hopes to present the many good local responses to this situation that are already under way.