There are three groups of people who inspire Fitsum (Fits) Petros, '18: her parents, her countrymen, and of course—superheroes. As a little girl growing up in Ethiopia, her passion for designing high-tech gadgets came from watching action movies and TV shows like American Inventor.

"The first time I watched Ironman, I kept thinking 'I want to build that suit,'" she says. "My friends and I were obsessed with the scene in James Bond when the car drives into the water, turns into an airplane, and flies. We tried to construct one using paper and an empty carton."

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Being a Part of Ethiopia’s Rebirth

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Marcus Hultmark has been tinkering with fluid mechanics since he was six years old. Growing up by the shore in Sweden, the open water was his neighborhood playground—and sailing and wind surfing were his childhood pastimes. “Sailing is sort of a nerdy sport,” he jokes. “There is an incredible amount of aerodynamics and fluid mechanics involved.”

From those early voyages developed an unquenchable curiosity for understanding how forces in nature act on the world around him. As an Assistant Professor of MAE, his research focuses primarily on turbulent flows, which involve large, chaotic fluctuations. From wind turbines to undersea vehicles, and sensor technology, Hultmark’s wide project scope has resulted in patented hardware and one-of-a-kind testing facilities while contributing to the basic understanding of fluid mechanics.

“It is hard to think of anything that exists in nature or was man-made that has not been affected by fluids in its various states at some point,” he says. “That means if you can learn something fundamental about fluid mechanics, then essentially, you can have an impact on everything.”

That impact can already be seen in one of Professor Hultmark’s key projects: testing wind turbines. With ever increasing portions of our electricity being provided by wind power, it has become more important than ever to maximize efficiency and reduce the maintenance and production costs of developing new wind turbines. For the first time, Hultmark has developed a scaled-down wind tunnel model to test turbine designs. “We basically had to find a way to compress the whole world down,” he explains.

And then there are the projects he never intended to work on. “During his experiments, Hultmark could never find sensors that obtained accurate measurements. So he decided to make them himself.”

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A couple of weeks ago, Hultmark had a reminder of how far her work has come. Her professor joked that building a hybrid car/plane was a useless pursuit. “But that is what I appreciate about this job—and science. You can make it whatever you want it to be.”