Tim Kunze grew up in Dresden, Germany. He recalls his childhood fondly, biking and hiking in the parks and mountains of the surrounding area. Tim describes Dresden as a modest place, with plenty of green space, and a lot of science and technology. With the city as his backdrop, it's no wonder that Tim was so interested in combining the natural and technical worlds when he grew up.

When Tim went to college, he studies computational science, a subject that seeks a symbiotic relationship between computer science and natural science, particularly physics and biology. In college, Tim's first contact with the principles of biomimicry was in solving complex problems. His first solution strategies tested were based, for example, on using a blueprint of the human immune system as a model for building a computer program.

In the natural world, our immune systems collect and store information about what belongs and doesn't belong in our bodies. Over time, as it gathers more information, the immune system adapts and fights diseases that it recognizes from the past. With nature as his model, Time worked on a computer program that was able to employ pattern recognition based on previous information–just like our immune systems!

Lature, during his PhD at The Dresden University of Technology, Tim continued his work in computational science and tribology. Tribology is the study of how surfaces interact with each other while in motion. Although tribology isn't intrinsically related to biomimicry, Tim's experience with surfaces and their properties would eventuall apply to his later work.

After his PhD, Tim moved on to the Fraunhofer Institute for Material and Beam Technology IWS in Dresden. There, Tim worked with and further developed a laser technology known as Direct Laser Interference Patterning (DLIP). DLIP applies laser technology to engrace tiny micro- and nanostructures onto material surfaces. In Tim's work, the surface structures that DLIP creates are inspired by nature. For example, Tim says that his three primary sources of inspiration are structures found on lotus wings, moths eyes, and Morpho butterfly wings. These three natural structures, when applied to man-made surfaces, give the surfaces distinct properties that improve their function in technical environments.

One example of DLIP's application is on the surface of airplane wings. The lasers engrave structures onto the wings that help prevent ice formation. Historically, the aviation industry has used harmful chemicals to prevent icing while in flight. However, with laser technology, it is thought that the solution could be entirely chemical free and environmentally friendly.

With help from the Fraunhofer IWS, as well as some key knowledge from nature, Tim and his co-founders lanched Fusion Bionic in 2021. As a company, Tim and Fusion Bionic are commercializing the DLIP technology and thus introducing bio-inspired surface structures to industries that might benefit.

While Tim's experience launching Fusion Bionic has been a good one, he says that it's not without some challenges. For one, Tim's primary academic training is in physics. Although he gained strong analytical skills through training in physics, Tim still recalls the challenges of moving from physics into laser technology. As the CEO of a company that utilizes DLIP, Tim has dedicated time and effort to make sure that Fusion Bionic is successful. Despite this challenge, it's clear that Tim and Fusion Bionic are channeling laser technology and biomimcry to power the future!

Click the header image to hear Tim's advice.