Imagine how hard it is for an autonomous robot to operate outside, moving over unknown terrain and dealing with unpredictable obstacles.

Insects on the other hand are excellent at this. In fact, social insects, like bees, ants, and termites are not only excellent at navigating their environment, they are also able to collectively take on complex tasks, like foraging over kilometer wide areas or building nests that are many orders of magnitude the size of the individuals.

We take inspiration from these to build simple and inexpensive robots that collectively can accomplish complex tasks like construction, motion through unknown terrains, flocking, and assessment of crops in fields.

And this is a two-way street, where insects may inspire better performance in robotics, robots may serve as tangible models and improve understanding of how these natural systems work as well.

We design the robots, develop the algorithms and simulations, and although most of our robots are capable of autonomous operation, we are also interested in decision support systems, to make it easier for people to interpret, interact with, and support the robots.

These are very interdisciplinary challenges that require input from a wide range of disciplines, including electrical engineering, computer science, mechanical engineering, entomology, and architecture.