

As part of the Carnegie Mellon University Experimental Biomechanics Laboratory, I am developing a bilateral lower limb exoskeleton emulator with two other doctorate students. I am designing a system to apply torque to the knee joint while my colleagues, Patrick Franks and Stefan Klein, are designing systems for the ankle and hip joints. Together, we will provide five actuation modes per leg consisting of one at the ankle (plantarflexion), two at the knee (extension and flexion) and two at the hip (extension and flexion). We will use off board motors to provide actuation creating a light weight universal testbed to experiment with a large variety of control strategies. With this device, we plan to assist human locomotion with a variety of speeds, grades, and loads.

At this conference, I am interested in other lower limb exoskeleton designs. I would like to see how others have tackled issues we have encountered and to gain some design insight. I am also interested in lower limb exoskeleton control strategies for healthy subjects as well as rehabilitation purposes.