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Abstract writing
Writing for Engineering
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Date: Oct 29, 2018

The purpose of this lab report is to explore the consequences of the muscle and tendon level in legs when women wear heels and when do not. The experiment was performed by two groups of young women: one group wore high heels around 40 hours a week for at least two years and the other group hardly wore heels in their lives. Electrodes and motion-capture reflective markers were used to track their leg-muscle activity while the length of muscle fibers was measured by ultrasound probes. Both group walked barefoot and with heels along a 26-foot walkway multiple times and the forces generated by their walking were measured by a plate contained in the walkway. The result shows that high heels wearer group use more forceful strides and move shorter distance than the other group because their calf muscle is shortened. The result also indicates that high heel wearer group use their muscle to walk which stays almost same in length while the other group use tendons, specifically Achilles tendons which lengthen and store elastic energy to help pushing the foot off the ground faster. The experiment not only explores the optical muscle-tendon efficiency but also shows the possible strain injuries including twisting ankles and ultimately losing the default shape of their foot while wearing high heels.