Prescripted Code: A Therapeutic Smart Device Used for Rapid Rehabilitation of Ligaments, Muscles, and Tendons

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The purpose of a Continuous Passive Motion (CPM) machine is to increase the healing rate of injured tendons, ligaments, and minor muscle injuries by moving a patient's joints. Our idea is to have a 3D printed smart CPM brace that evolves on the current purpose of the CPM machine and address the downsides of the old designs by being lightweight, user-friendly, and affordable. To begin with, a physical therapist would be able to prescribe an exercise, similar to a medical prescription, by uploading code to the device. The code will tell the device what movements to make and will be customized for each patient's own needs. The idea of Telemedicine is also incorporated, the use of telecommunication and information technology to provide clinical health care from a distance. This device will allow much more independence to the patient by giving them more choice in their treatment and less dependence on the physical therapist. If the patient follows the instructions of their physical therapists by doing the prescribed exercise, they will experience all of the benefits of using a normal CPM machine such as a faster healing rate, further range of motion, and reduced pain. The CPM brace will be custom created for each individual patient using a 3D printer. This allows the brace to be quickly and affordably created. Some features that are included to assist the user are wifi capabilities, a rechargeable battery, an LCD screen, a feedback system. inertial measurement units, and a heated pad.

Awards Won:

Air Force Research Laboratory on behalf of the United States Air Force: First Award of $750 in each Intel ISEF Category