Smart Shoes and Exosuit

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Approximately 350 million people worldwide have arthritis. Arthritis is an inflammation of the joints, it can affect one joint or multiple joints. The most common type of arthritis is Osteoarthritis (OA), which is a long-term chronic disease involving the thinning of cartilage in joints which results in bones rubbing together, causing pain, loss of strength, flexibility, & impaired movement. Many people develop OA by either aging or injury. Our main problem is the late diagnoses of OA as some people tend to ignore the symptoms mistaking them for normal injuries. But we also took into consideration the Osteoarthritic patients who are have very limited range of motion & are dependent on others for daily tasks. We aim to solve this crucial issue that affects millions worldwide targeting athletes & elderly people that are most prone to OA. It will detect OA in its early stages, treat its symptoms & assist in movement for those who have limited motion. This project is comprised of three main parts: 1. Smart Shoes: The Smart Shoes detect OA in its early stages by measuring the plantar pressure of an individual's foot which comes in a package with an app. 2. Smart Suit: To complete the early detection of OA, a package with the Smart Shoes, will detect muscle & joint stiffness. If all 3 conditions are present, we are able to detect the specific pathologic joint. The Smart Suit also consists of therapy which treats the affected joint. 3. Exosuit: When walking is too painful or not an option, the exosuit will assist movement. An Exosuit is an attachable mobile machine system that assists in movement. Our main goal is to decrease pain as much as possible & leave patients with OA independent to do daily tasks with this exosuit.

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