Device for Treating Idiopathic Toe-Walking
Chapman Case #2020-003

Market Need
An estimated 5% of the children population exhibit idiopathic toe-walking. Although toe-walking is a common diagnosis in pediatric orthopedics, there is currently no method to successfully retrain a heal-toe gait in these toe-walking children. If these children do not grow out their toe-walking behavior before entering into adulthood, they may have to go through invasive interventions such as leg braces, serial basting, botox, and surgical lengthening of the Achilles tendon. To reduce the needs for invasive interventions among toe-walking children, there is need for an effective solution to help train these children to walk properly before it is too late.

Chapman Solution
Professor Marybeth Grant-Beuttler and Professor Rahul Soangra at Chapman University have invented a wearable sensor-based shoe insole for training toe-talking patients to obtain proper gait. Electronic sensors are strategically placed in the insole to detect the presence of toe-walking, and if detected, a haptic feedback is immediately delivered to the wearer to remind them to change their gait to walking properly.

This working prototype provides the foundation for future design iterations that collect and send gait data wirelessly to a mobile handset, enabling frequent data collection/analysis, and performance tracking of the wearer. The invention will help physicians and physical therapists utilize innovative intervention methods for gait training in idiopathic toe-walkers.

Applications
• Non-invasive and in-home treatment solution for idiopathic toe-walking patients
• Pediatric diagnoses with increased incidence of toe-walking
• Athletic performance enhancement

Key Publication
• Customerized Wearable Sensor-based Insoles for Gait Re-training in Idiopathic Toe-Walkers

Intellectual Property
• U.S. patent application: 17/181,238

Stage of Development
• Working prototype demonstrating intervention of idiopathic toe-walking in children
• Available for licensing and further research collaborations