GATTII: Wearable Portable Screening Device for Gait Analysis

Jain, Sidharth (School: Jamnabai Narsee International School)

The present invention is a wearable shoe to capture various specific GAIT parameters such as spatial-temporal, clearance and plantar pressure distribution. The invention is integration of pair of shoes, foot pressure sensing sensors, GSTU Module – Gait Synchronisation Time Unit, distance measurement sensors, wireless module, microcontroller and on-board power supply. Physiotherapists assess & analyse gait mobility patterns by observation, simple functional performance assessments or Ink blotted paper. 3D laboratory based gait analysis is less accessible (only available in top Healthcare units), time consuming and expensive. Gattii - a wearable, portable accessible shoe secured to the foot to freely ambulate in unrestricted environment. The force sensors sense forces exerted by the foot. The motion sensors sense a motion of the feet and lower limb of body. The microprocessor (i) stores the received data in a memory affixed to the shoe, or (ii) wirelessly transmit the received data to other computing device or cloud. Gattii has been tested on Accuracy test @ 90%, Precision test @ 96%. On conducting the Specificity and Sensitivity test Gattii scored very well. The invention is used to measure GAIT parameters such as speed(m/s), stride time(s), stance time(s), swing time(s), stance phase(%), swing phase(%), double support phase(%), foot-flat stance(%), cadence (steps per min), number of steps and spatial parameters like step length(m), stride length(m), step width(m), strike angle(degree), lift-off angle(degree), step height(m) and clearance parameters like max heel, max toe, toe-in and toe-out, tremors. The wearable shoe measures plantar pressure distribution at 6 points of foot. It provides bio-feedback to the user while walking to improve the gait of user.

Awards Won: