

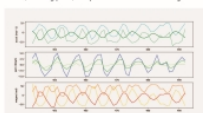
EMBEDDED SHOES

Embedded shoe is an intelligent instrument that collects user behavior through distributed sensors to inform FTR technology. Powered by AI Coach, the shoe can provide real-time physiological data on gait analysis, weight, running performance, as well as performance feedback, fatigue measurement, personalized training plan, ultimately catering to individual user. The Embedded Shoes can further provide unique experience with the adaptation of 'BioDesigned' materials.

SENSORS

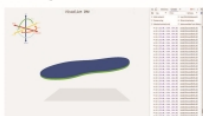
Acceleration: tracking your speed

With an accelerometer, the shoe can accurately monitor step count, running pace, and provide movement data in gait analytics.



Gyration: protecting your ankles

Gyration provides a 3D representation of angle displacement of the foot and helps to add data for more accurate gait analysis and AI training.



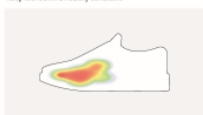
Pressure: monitoring your running form

Pressure sensor consists of 6 pads, by which we are able to gain a 2D representation of foot imprints during run cycles every 20 msec. It is used to determine center of mass and weight distribution which leads to estimates in pronation and gait analysis.



Temperature & humidity: for your foot wellbeing

Temperature and humidity sensor help to monitor the in-shoe environment. It reminds the user to clean and change shoes to keep the feet in a healthy condition.



COMPONENTS

Flexible plastic-copper PCB

Establishes routing of components, battery, and sensing components onto the microcontroller.



Haptic vibrators

Haptic vibrators are distributed around the upper shoe to provide haptic feedback to users on desired feature (i.e. changes in running form, 1-mile benchmark, etc.)

Flat flexible connectors

Pressure sensitive pads

A commonly used pressure sensitive fabric, velostat, is used to monitor changes in applied pressure to the sole. Velostat is sandwiched between two copper sheets to create custom sensor pads.

Thermal laminating plastic



APPLICATIONS



Gait analysis and stability control. Activates stabilizers in the shoe to adjust and bring more support.



Realtime weight and weight distribution monitoring



Livestream data management, analysis and sharing



Fatigue tracking



Calories burned, walking & running steps, altitude, etc.