

Arduino Pressure Sensor Cushion for Tracking and Improving Sitting Posture

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Abstract : The average American worker sits for thirteen hours a day, often with poor posture and infrequent breaks, which can lead to health issues and back problems. The Smart Cushion was created to alert individuals of their poor postures, and may potentially alleviate back problems and correct poor posture. The Smart Cushion is a portable, rectangular, foam cushion, with five strategically placed pressure sensors, that utilizes an Arduino Uno circuit board and specifically designed software, allowing it to collect data from the five pressure sensors and store the data on an SD card. The data is then compiled into graphs and compared to controlled postures. Before volunteers sat on the cushion, their levels of back pain were recorded on a scale from 1-10. Data was recorded for an hour during sitting, and then a new, corrected posture was suggested. After using the suggested posture for an hour, the volunteers described their level of discomfort on a scale from 1-10. Different patterns of sitting postures were generated that were able to serve as early warnings of potential back problems. By using the Smart Cushion, the areas where different volunteers were applying the most pressure while sitting could be identified, and the sitting postures could be corrected. Further studies regarding the relationships between posture and specific regions of the body are necessary to better understand the origins of back pain; however, the Smart Cushion is sufficient for correcting sitting posture and preventing the development of additional back pain.

Keywords : Arduino Sketch Algorithm, biomedical technology, pressure sensors, Smart Cushion

Conference Title : ICBEB 2019 : International Conference on Biomedical Engineering and Biomaterials

Conference Location : Rome, Italy

Conference Dates : September 17-18, 2019