Health chair: find out your physical well-being in one sitting

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Martti Vapalahti, a student of the Master’s Programme in Life Science Technologies at the Aalto University School of Electrical Engineering, did his master’s thesis “Health chair—easier non-invasive measurements for health monitoring” in the Dept. of Electrical Engineering and Automation. The thesis experimented methods that could reduce the cumbersome hassle that is often associated with health measurements to enable quick and easy health status monitoring in places like nursing homes. Promising design ideas were tested and the limited experiments suggest that they might provide solutions for the forementioned application area.

Movement is a major issue in several non-invasive health measurements. A perfectly fine technical implementation can be rendered useless by a mere nervous fidgeting. Another issue of these measurements is that they often require various finger clips, adhesive pads, and wires that must be carefully attached which takes time and energy. In places like nursing homes, this time and energy could be allocated to more meaningful tasks by performing these measurements with a health chair where the subject just rests their hands on the armrests. If a comprehensive health status could be recorded with such ease, periodic measurements would provide a graph of one’s health which then could indicate starting diseases before any severe symptoms.

To solve these challenges, all but one measurement sensor were embedded in the chair: the blood pressure will still require an inflatable cuff. The other measurements (that represent the condition of the heart, blood vessels, and lungs) are the electrocardiography and pulse oximetry. A bioelectrical impedance measurement was also desired but its development is still in progress. A final product would also have a weight measurement. The preliminary tests in good conditions suggest that the hand support structures provide adequate support and that the convenience was not achieved by sacrificing too much of the accuracy.

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