Printed stretchable electronics for unobtrusive biosignal monitoring

Matti Mäntysalo

Laboratory of Electronics and Communications Engineering,
Tampere University of Technology, Tampere, Finland
matti.mantysalo@tut.fi

Wearable electronics is currently one of the fastest growing electronics markets. Specifically, with the sports and healthcare industries showing a particularly strong interest in the field, as wearables present possibilities of measuring one's vital signals unobtrusively. Today's wearable electronics is mainly based on wrist, head, and chest worn concepts. However, textile integrated solutions are continuously being introduced by researchers and industry. The next paradigm shift in wearable electronics is going to be epidermal electronic systems (EES) enabled by recent advances in flexible and stretchable electronics technologies. EES can conform to temporary transfer tattoos and deform with the skin without detachment or fracture. EESs are developed to monitor, for example, electrophysical signals (e.g. ECG, EMG), temperature, skin hydration, lactate level, and movement disorders. In many cases, the main idea has been wireless monitoring of body signals and functions for healthcare and assisted living applications. Most EESs dedicated for body monitoring are fabricated in complex and costly vacuum and lithography processes. However, the proposed approach utilizes low-cost printing processes enabling the wider exploitation of the results.
This presentation focuses on recent development in printed stretchable electronics and its advances in smart textiles and epidermal electronic systems.