Wearable Technologies Research Laboratory
4IR Advanced Research and Innovation Park
Department of Electrical and Electronic Engineering, BUET

Overview:

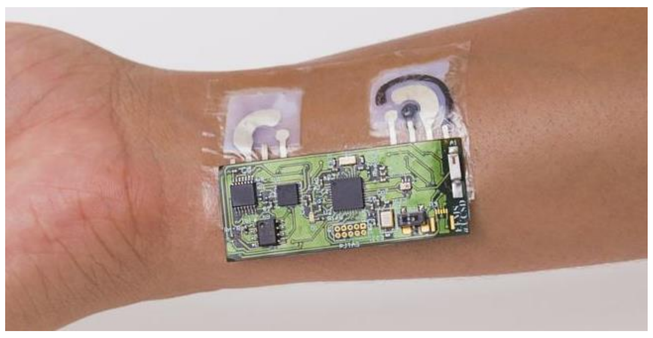
The Wearable Technologies Research Laboratory aims to pioneer advancements in wearable sensors for both physiological signal measurement and virtual reality applications. Wearable technology innovations can revolutionize patient monitoring and recovery with lightweight, printable technology that enhances safety in recovery after medical operations and aids in detecting health complications. We also aims to integrate optical lenses and interaction sensors in augmented reality to create immersive, responsive experiences in education, entertainment, and training. By addressing key research challenges in the path way of smart Bangladesh and collaborations with world-renowned faculty, students, and industry partners, we aspire to accelerate innovation and practical applications of wearable technology to improve health outcomes and user experiences.

Primary Areas of Research:

- ❖ Wearable Sensors and Electronics
- ❖ Virtual Reality and Augmented Reality
- ❖ Flexible Electronics

Mojo AR Contact Lens Glass: Wearable for Daily Life AR Experience (Mojo Vision 2022)

Smart Ring: Sleep, Heart Rate, Fitness Tracking Wearable (Oura Ring Gen3)



Flexible wearable electronic skin patch to monitor alcohol levels (http://cws.ucsd.edu)

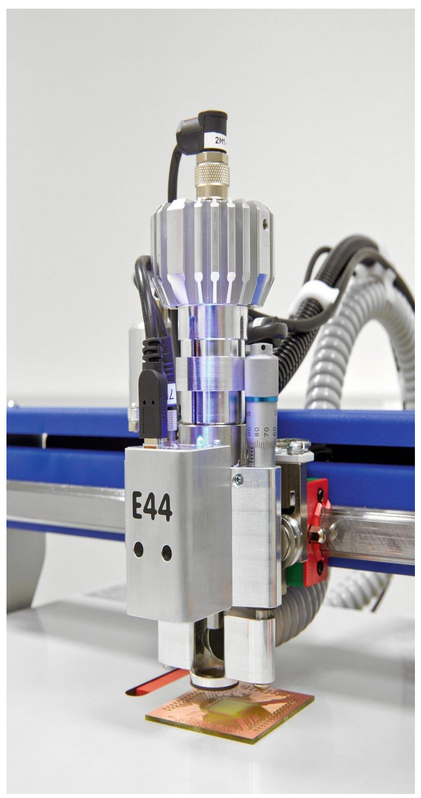
Virtual Reality Laboratory: Courtesy from Centre for Secure, Intelligent and Usable Systems (brighton.ac.uk)

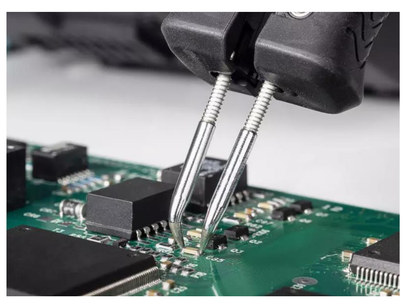
Key Objectives:

- ❑ Developing wearable sensor systems with real-time feedback that enable a wide range of preventive-health, security and fitness applications.
- ❑ Integrating wearable sensors to have augmented and mixed-reality experiences for enhancing user immersion and interaction in numerous applications including therapeutic treatments for patients, training simulations, and interactive entertainment.

Key Facilities:

- ➢ MEMS fabrication facility
- ➢ Physiological data acquisition equipment
- ➢ Setup for experimenting VR/AR/MR environments





Prospective Projects and Applications:

- ➢ Developing wearable sensor for alcohol detection, such as for alcoholic test for drivers
- ➢ Developing wearable devices for measuring body electrolytes, such as detecting electrolyte imbalance in human body
- ➢ Investigating how different content cues (e.g., graphics, color, scale, contrast, texture, orientation of virtual objects) and remote actions (e.g. gaze, pinch, weight lift) impact on AR experiences.
- ➢ Designing cost-effective smart phone-based interactive systems for real-life AR experiences
- ➢ Designing efficient algorithm for virtualization of real environments and tracking algorithms in 3D environments

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