



Soumya Subhra Basu

*Doctoral Student, 2nd year
Embedded Systems Lab,
Ecole Polytechnique Federale de Lausanne,
Switzerland*

Email: soumya.basu@epfl.ch

Phone: +41 768 199 624

Project name: E4Bio (Electronics for Biomedical Applications).

Description: Development of hardware-software co-design architectures for processing of bio-signals from wearable body monitoring systems.

Target industry: Medical technologies.

Target: According to the World Health Organization (WHO), cardiac diseases are responsible for the majority of deaths worldwide. Cardiac patients need extensive monitoring, which incur in huge costs. Autonomous Wireless Body Sensor Nodes (WBSNs) are cheap and non-invasive alternatives, providing the possibility of real-time monitoring, thereby also reducing effort on the physician's side. However, large power consumption occurs owing to the transmission of data from the nodes to the receiving device, which strains the limited on-board supplies. In state-of-the-art WBSNs, *smart* processing on-board does selection of relevant data to be transmitted, hence reducing transmission power dissipation. In such a scenario, energy-management becomes critical.

Technical specs: I am developing a novel low-power processing system in the field of bio-signal processing, which is based on Coarse Grained Reconfigurable Architectures (CGRA). The aim is to accelerate processing of huge amount of data derived from bio-signals acquired from (WBSNs), which are mostly processed in parallel and have loop-intensive segments. Multiple processing elements of CGRAs exploit this parallelism, thereby reducing run-time and energy overhead. CGRAs can work with a wide spectrum of bio-signal processing applications.

Targeted market: The main targets of the envisaged product as a successful result of the project are patients who dwell in areas with limited access to medical facilities, a situation which is common in rural India. Apart from them, another possible market is the urban medical sector, including clinics/hospitals.

Advantages: This approach provides cheap, non-invasive, low-power, extensive, and less labor-intensive monitoring of cardiac patients.

Objectives: During my stay at Bangalore, my aim will be to expand my entrepreneurial know-how. I want to gain hands-on experience of working in emerging markets, study product viability, and to make important contacts, with other entrepreneurs as well as personnel from the local medical industry.