Workshop Outline

Name of workshop: AI augmented heart monitoring using PCG and ECG signals
Minimum Eligibility: Completed 2nd Year in Engineering from disciplines such as, Electronics, Electrical, Instrumentation, Computer, Biomedical Engineering
Instructor: Professor Yue Rong, Curtin University, SPARC visiting faculty
Workshop duration: 2 days, 6 hours/day **Maximum No. of participants:** 50

Workshop Description:
This workshop introduces non-invasive heart diseases diagnosis techniques through monitoring the phonocardiography (PCG) and electrocardiography (ECG) signals using augmented artificial intelligence (AI). It includes introduction to the background on heart sound signals, digital stethoscopes, PCG and ECG signal feature extraction, classification, and machine learning. At the completion of the workshop, participants can develop understanding of non-invasive sensing for affordable diagnosis of heart disease. They can practice basic PCG and ECG signal processing and machine learning algorithms.

Workshop Contents *(tentative)*

Time	Topic	Contents
Day 1 (hour 1)	Introduction	Physiology of heart sounds; Heart sound measurement; PCG and ECG device
Day 1 (hour 2)	PCG signal processing	Signal pre-processing and segmentation
Day 1 (hour 3)	Lab session 1.	PCG signal filtering and segmentation using Matlab
Lunch break		
Day 1 (hour 4)	PCG signal processing	Single channel noise suppression
Day 1 (hour 5)	PCG signal processing	Single channel noise suppression
Day 1 (hour 6)	Lab session 2.	Adaptive PCG noise cancellation using Matlab
Day 2 (hour 1)	Feature extraction	PCG and ECG signal feature extraction
Day 2 (hour 2)	Feature extraction	PCG and ECG signal feature extraction
Day 2 (hour 3)	Lab session 3.	Power spectrum and other feature calculation using Matlab
Lunch break		
Day 2 (hour 4)	PCG classification	Classical machine learning classifier
Day 2 (hour 5)	PCG classification	Deep learning classifier
Day 2 (hour 6)	Lab session 4.	Practice PCG signal classification