Engineering Tripos Part IIB
Project Planning Form 2021/22

Students should submit this form to Group Administrators by **Friday 11 June 2021**. If plans evolve over the summer, please update and resubmit.

Name of student: Jordan Smith Email: js2432@cam.ac.uk

College: Christ's Director of Studies: Dr Sam Stanier

Project is: Type (a)

Name of supervisor: Dr Elena Punskaya

Short title of project: Data of Your Heart: Screening for Atrial Fibrillation

Project reference code (e.g. B-ANO22-1 / B-ANO22-type(b)): F-OP205-1

Aims of project:

The heart is an efficient, generally reliable mechanical pump driven by electricity. When the usually smooth electrical activation breaks down and the flurry of electrical activity in the upper chambers of the heart makes the atria contract fast and erratically, the electrical chaos of Atrial Fibrillation (AF) ensues. Instead of contracting rhythmically, and thus forcing blood into two lower chambers (ventricles) consistently, the atria quivers and potentially may let the blood sit, thus allowing clots to form. These clots can enter the bloodstream and block arteries in the brain, causing a stroke.

AF is a common abnormal heart rhythm which is associated with a fivefold increase in stroke risk. However, it can occur only intermittently, so is often not recognised. To address this, the SAFER Study https://www.phpc.cam.ac.uk/pcu/research/research-projects-list/other-projects/safer/ is trialling an approach to screen for AF using portable electrocardiogram (ECG) devices. Patients record their ECG signal, a measure of the heart???s electrical activity, four times per day for three weeks. This allows even infrequent AF episodes to be detected, but the recordings must be manually reviewed to make a diagnosis, and only a small proportion of them contain AF.

Since almost 200,000 recordings have been collected so far, there is an urgent need for automated algorithms to determine which ECGs should be reviewe

The project will involve the analysis of ECG tracings (almost 200,000 recordings have been collected so far) obtained directly from SAFER study participants. The objective is to develop an algorithm to streamline the review process.

The project will involve collaboration with the SAFER team.

Workshop/laboratory facilities needed:

Any special safety implications:

Signature of student:

Signature of supervisor: