Application number/Title: **30769** - Automatic Assessment and Quantification of Cardiovascular MRI exams

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**Keywords provided by the Applicant PI to describe the research project:** MRI, cardiac, imaging, machine learning

**Application Lay Summary:**
In this study, we will develop machine learning based algorithms for automatic assessment and quantification of cardiac MRI exams in the UK Biobank cohort. Automated image processing is a key enabler in facilitating biomarker discovery in large cohorts such as the one in UK Biobank. Results from this automated analysis will be made available to the research community for further statistical analysis jointly with other data collected for the same subjects. We will develop computer algorithms that will automatically analyze the individual images from the entire cardiac MRI exam for each subject and identify, characterize and quantify key anatomical entities (such as the chambers of the heart, the motion of heart muscle, flow in the aorta etc.). The algorithms will derive measurements from these images in a standardized manner, obviating the need for tedious manual work. We will include the entire Cardiac MRI cohort (100,000 subjects) in this study. In addition to the imaging data, we also request some other metadata such as age, sex, height, weight, body mass index, heart rate, systolic and diastolic blood pressure, and 12-lead ECG data at rest, smoking history, medication status, results of the blood test (cardiac specific biomarkers).