

Project proposal template – Faculty studentships Summer 2014

<i>Project title</i>	Detection and quantification of arterial obstruction in acute pulmonary embolism	<i>Director of Study</i>	Prof Jamshid Dehmeshki
<i>Second Supervisor</i>	Prof Tim Ellis	<i>School</i>	Computing and Infor <input type="button" value="v"/>
<i>Other members of supervisory team</i>	Prof Salah Qanadli (Laussane Hospital and visiting professor at KU)	<i>Any requirements from applicant (eg degree in specific subject area)</i>	

**Project summary
(max 1,000 characters)**

A pulmonary embolism (PE) is an obstruction within the pulmonary arterial tree that in the majority of cases arises from a thrombosis that has travelled to the lungs via the venous system. PE is a fatal condition that affects all age groups and is the third most common cause of death in the US. Computed tomographic angiography (CTA) is an accurate imaging technology widely used in the diagnosis of pulmonary embolism. However, each CTA scan contains hundreds of CT image slices, and the accuracy and efficiency of interpreting such a large image data set using manual reading and interpretation is time-consuming and prone to error due to the ambiguous appearance of PE-like structures and human factors such as attention span and eye fatigue. Consequently, objective methods of computer-assisted image analysis based on computer aided detection (CAD) and measurement (CAM) can be applied effectively to assist radiologists in detecting and characterizing emboli in an accurate, efficient and reproducible manner. The aim of this project is to develop 3D image processing algorithms:

1. To detect and segment pulmonary arteries and label its major branches
2. To detect, locate and characterise pulmonary embolism within each branch
3. To define and evaluate a specific index to quantify arterial obstruction in acute pulmonary embolism.