PhD Studentship: Rapid bacteria colony counting algorithm development

Programme Description
The University invites applications for a PhD student to join our Hertfordshire Knowledge Exchange Partnership (HKEP) scheme. This four-year project requires a PhD student to undertake a collaborative research project with support from University academic supervisor(s) and company scientists. The project begins with a Knowledge Exchange year in which you are based in the company. Successful completion of the first year will require the submission of a scientific report, research proposal and an oral examination. The successful candidate will then begin a three-year PhD research project in an area of interest to the company.

Start date: January 2019  
Duration: Four years  
Company: Synoptics Limited, Cambridge  
Stipend: Starts at £15,220 per annum plus approved expenses. All students will also receive a maximum contribution towards their individual tuition fees that is equivalent to the Home/EU student fee in each year of registration.

Project Overview:
Bacterial colony counting is widely used in both industry and research laboratories in a wide range of applications; these include quality control, environmental monitoring, immunological studies and medical testing. The number of colonies on an agar plate can be used to estimate the number of viable bacteria (total viable count) present in a test sample. This can then be used as an indicator of the cleanliness of a surface, the sterility of a product or the presence of a bacterial infection.

Traditionally, colony counting was performed manually or using a light box which was time-consuming and prone to human error. The advent of automated colony counters, which use sophisticated algorithms to detect and count colonies based on shape or colour, has overcome these drawbacks. The popular technologies exploited for bacteria colony counting are edge detection techniques for image processing.

However, a number of challenges remain in automated colony counting: identifying and splitting touching colonies, background noise, colony density variance etc. Hence, more advanced and sophisticated techniques need to be developed to cope with these issues while taking efficiency into account.

The aim of this project is to propose and implement new algorithms which are robust to noise for rapid bacterial colony detection and counting.
Supervisor Information

- Dr Na Helian
- Dr Yi Sun
- Dr Peter Lane
- Mr Richard Hopwood

Eligibility

The successful candidate’s CV will need to demonstrate the following:

Essential

- Educated to degree level or to an equivalent standard in a computer science subject;
- Experience of integrated programming and databases from academic studies or work experience;
- Competence in process model and data analysis as a substantial component of undertaken studies.
- IELTS 6.5 (or above)/TOEFL 79 (if international student)
- Ability to work on own initiative;
- Communication and writing skills;
- Good IT skills, including MS Office;
- Effective team worker;
- Ability to work to tight deadline, dealing with conflicting priorities and work under pressure;
- Willingness and ability to work flexibly and to adapt to changing demands

Desirable

- Upper 2nd class or above Undergraduate degree;
- Proven research ability;

Application Process

For further information and to apply for this role please email hsp@herts.ac.uk. The deadline for applications is **31st October 2018**

Informal enquiries should be addressed to Dr. Na Helian (n.helian@herts.ac.uk). Please note that applications sent directly to these addresses will not be accepted.

*If you have not heard within 3 weeks of the closing date, you have unfortunately been unsuccessful.*