

# Proposal for Teaching Aligned Recruitment

This proposal aims to support Strategy Committee in identifying topics/fields for future recruitment of teaching staff. The approach taken here is to map out areas of high student demand, e.g. resulting from consecutive years of UG student over-recruitment and continuing high application numbers for some of our MSc degree programmes. In addition, this proposal offers suggestions for future curriculum development, where new teaching staff could lead the development of course of potential high demand and high relevance. Unlike the narrowly defined areas for recruitment defined by Institute Directors, the areas in this proposal are more broadly defined based on the understanding that a hire in a more specific area could contribute to teaching of the broader subject area.

## Areas of High Student Demand

The School has seen several years of over-recruitment in our UG programmes, while at the same time recruiting at a very high intake level for MSc programmes. Unfortunately, demand for programmes and courses is not uniformly distributed, but students' interests focus on a relatively small set of programmes and courses, which in turn result in high demand for teaching/project supervision for teaching staff in those areas.

### 1. **Practical Software Engineering**

For many years the School's curriculum in the space of software engineering has been relatively weak despite us offering a dedicated Software Engineering degree. The consequences of this development are that (a) our Software Engineering and Computer Science degrees are virtually identical and we do not produce Software Engineering graduates with distinct attributes, (b) there is a mismatch between student demand for practical software engineering courses, while we hope that students pick up elementary software engineering skills from other courses (e.g. SDP, ILP, Honours Project). It would be good to strengthen the software engineering field with a view of meeting the demand in this area.

### 2. **Machine Learning**

Machine Learning has been and is likely to continue an area of high demand, both from UG and PGT students. It appears student demand is so high as to absorb any additional capacity for teaching in this space. Courses in ML are among the largest in the School, with students often taking multiple ML courses. Demand for projects (UG, MSc) is also heavily skewed towards ML.

### 3. **Natural Language Processing**

The situation around NLP is similar to that of ML. Within the last 10 years student demand for NLP courses has grown substantially. Growth in the NLP area would contribute to satisfy this student demand, and provide relief for existing teaching staff who experience e.g. very high demand for project supervision.

### 4. **System Design**

Our System Design Project is certainly a highlight in the "career" of all of our undergraduate students. With its team oriented approach to learning, focus on large scale system design and opportunity to co-create within a flexible learning and teaching environment, our SDP is likely to become a serious bottleneck in the face of increasing UG student numbers. Recruitment of teaching staff able to contribute to the SDP, or to provide alternatives to the existing SDP course (achieving similar learning outcomes and by offering a similar learning experience) would help the School in maintaining this critical course.

# Areas for Future Curriculum Development

## 5. **Real-Time Computer Graphics**

Many of our students join University with the desire to acquire the skills enabling them to pursue a career in games development. While games development is a broad field including AI, software engineering, parallel programming, software optimisation, and others, the single-most important field of competence for game designers is probably real-time computer graphics. Anecdotally, our students are craving for more courses preparing them for a future career in this field, and we have evidence that students are actively following alternative offerings (summer schools, internships, etc) externally. With a healthy local computer games industry and student demand hiring in the space of real-time computer graphics would enable us to close this gap in the curriculum.

## 6. **Web/Cloud/Mobile Software Architecture/Development**

Decentralised web/cloud/mobile software architectures have become the norm and are widely used in industry. While our curriculum touches upon this, e.g. Extreme Computing, or Distributed Systems, these course do not encompass the challenges and methodologies for modern software development targeting cloud based platforms with web or mobile front-ends. There is demand from students to acquire skills in this area, and hence this could be an area for a course which could attract good student numbers.