Imperial College
London

Industrial Liaison Board, Department of Computing

20th May 2008
5pm
Ballroom, 58 Prince's Gate
South Kensington Campus

Minutes

Present: Dr Xeno Andriopoulos (Kinitron), Professor Robert Berry (IBM), Robert Chatley (Google), Mr Patrick Goldsack (Hewlett-Packard Laboratories), Dr Constantine Goulimis (Greycon Ltd.), Mr Simon Holden (Morgan Stanley), Dr David Jeffery (Betfair), Dr Mike Rodd (BCS), Dr Nigel Walker (BT), Dr Krisztian Flautner (Arm Ltd.).

Computing: Professor Chris Hankin (Deputy Principal Faculty of Engineering), Professor Jeff Magee (Head of Department), Professor Susan Eisenbach (Director of Studies), Mrs Anne O'Neill (Department Operations Manager), Dr Michael Huth (Third Year Co-ordinator), Professor Morris Sloman (Director of Research), Dr Tony Field (Deputy Director of Undergraduate Studies), Professor Daniel Rueckert (Professor of Visual Information Processing), Professor Berc Rustem (Professor of Computational Methods in Operations Research), Dr William Knottenbelt (Industrial Liaison Co-ordinator), Miss Amy Allinson (Industrial Liaison and Student Support Officer).

Presentations: Professor Murray Shanahan (Professor of Cognitive Robotics), Professor Guang-Zhong Yang (Chair in Medical Image Computing).

Apologies: Professor David A. Oxenham (Dstl)

Agenda Item

1. Welcome and Introduction

Professor Jeff Magee welcomed all members to the first meeting of the Board and gave a brief introduction.

2. Membership and Terms of Reference

The Membership and Terms of Reference were presented to the Board as outlined in Paper 1 and approved.

3. Teaching

(a) Overview
Professor Susan Eisenbach presented an overview of Teaching including an outline of the curriculum, information on admissions and the importance of research in the curriculum.

(b) Discussion
Members of the Board were keen to explore the content of the management courses in the MEng Computing 3rd year. Professor Eisenbach reported that a management course is required and includes project management, accounting and organisational behaviour. Students may specialise in Computational Management which teaches advanced computational methods for quantitative problems in management decision making.

The Board requested further information on how students are selected. It was reported that applications for Computing have decreased UK-wide. At the height the Department's ratio of applications to offers was 17-1, this year the department received approximately 540 applications and made approximately 320 offers. It is believed that applicants have been self-selecting and the best students have still applied. It was reported that the Department's Undergraduate Interview Days, which include a 30 minute structured one-to-one interview, are a key aspect of the selection process and enable the Department to 'sell' to the best students. It was noted that these days also encourage the involvement of parents who are an increasing influence in the student's choice of University and course.

The Board also sought further information on the make up of the student population. It was reported that approximately 15% of our students are female. It was noted that recruiting female students is challenging and that this has implications for recruitment in the technology sector. Professor Jeff Magee reported that 25% of staff in the Department is female which may help to attract more female students. In terms of student nationality the Department is seeing an increase in students from the EU, however, it was noted that the proportion of overseas students is lower than other Engineering departments in the College which means the Department receive less College funding in this area. Professor Magee cited a recent Guardian report based on Higher Education Statistics Agency data which highlighted some interesting clusters of overseas/EU students at certain Universities, for example Chinese students predominantly in Manchester University and Greek students at City University.

The challenge of the increasing lack of selection provided by A-Levels was noted and Professor Eisenbach reported on the College's plan to trial an Entrance Examination. The advantage of this being that extra rigour may attract more of the best students, however, some may be deterred and there are concerns about a negative impact on widening participation.

It was noted that there is a strong focus on teaching fundamental principles in the first year of the undergraduate course and the issue of keeping students motivated was raised. Dr Krisztian Flautner (ARM Ltd) explained that Georgia Tech had found that their first year courses were de-motivating students and that the drop-out rate reduced when the emphasis of the curriculum was changed.

Mr Simon Holden (Morgan Stanley) commented that the strength of Imperial Computing students is their versatility which is the result of the focus on developing a solid foundation of principles and knowledge from the first year. Rather than teaching specific technologies the curriculum provides students with an understanding from the ground up which gives them with the ability to learn new languages and adapt quickly and effectively. In industry the ability to be

flexible and versatile is essential and this is a key selling point which makes the Department's students highly sought after.

Professor Robert Berry (IBM) commented on the importance of softer skills and explained that recruitment processes may be cutting out some of the brightest students due to poor non-technical skills. These skills are particularly important in areas such as requirements gathering and client engagement. Professor Eisenbach explained that group projects are one way to encourage students to develop their 'soft skills' however there is a tension between group and individual marks with some students feeling that summative marks should not rely on others. Dr Robert Chatley (Google) also highlighted the importance of working with non-technical colleagues and cited an example of Carnegie Mellon University where computing students worked on a group project with graphics and drama students.

Professor Berry raised the importance of integration and how this can be best taught. Graduates often want to work on the latest 'new thing', however being able to integrate and work on existing software is vitally important in industry. Professor Eisenbach explained that the curriculum does include some reverse engineering in the 4th year software engineering course.

4. Research

(a) Overview
Professor Morris Sloman presented an overview of the Department's Research activities including the Department's research mission and structure. Some key research areas were highlighted and further written information was provided to Board members on research areas not covered.

(b) Example Research Projects
(i)Cognitive Robotics: Professor Murray Shanahan, Professor of Cognitive Robotics, Logic and Artificial Intelligence group, gave an overview of current research in the area of Cognitive Robotics including LUDWIG and the i-Cub.
(ii)Body Sensor Networks: Professor Guang-Zhong Yang, Chair in Medical Image Computing, Visual Information Processing Group, gave an overview of current research on Body Sensor Networks.

(c) Discussion
Professor Daniel Rueckert reported that the Department had successfully commercialised research in some areas as illustrated by the commercialisation of research in Visual Information Processing via an Imperial College London spin-out company IXICO which currently employs 20 people.

Professor Chris Hankin explained that the College agreed a 15 year pipeline agreement with Imperial Innovations in 2005 which allows Imperial Innovations to commercialise technology originating from the College's research activity.

Mr Patrick Goldsack (HP Laboratories) commented on the importance of research training for employers, it being noted that HP laboratories do not hire lower than masters level. The Board asked that PhD students be considered as a topic for further discussion at the next meeting.

Dr Nigel Walker (BT) commented that Control Theory is an important concept. It was noted that a key skill we foster better than other disciplines is abstraction.

5. Strategic Initiatives

(a) Corporate Partnership Programme
Dr William Knottenbelt presented two examples of structured partnership programmes to the Board, the Stanford Computer Forum and the Cambridge Laboratory Supporters Club, and sought the Board's views on setting up a Corporate Partnership Programme, their experiences with existing partnership programmes and the benefits they would expect. It was noted that currently we have no framework for interaction with companies who just want to recruit our best students and this is something companies have asked us for. A partnership programme would enable us to provide a consistent level of service to all and provide a source of funding to cover the costs associated with liaising with Industry.

Dr Flautner (ARM Ltd) commented that although this may work from the HR-side of the relationship he felt the use of Alumni connections would prove more successful.

Mr Holden (Morgan Stanley) felt that what was being proposed was already happening and noted that the relationship between the Department and Morgan Stanley was initially driven by Morgan Stanley HR who had then sought his support as a Department of Computing Alumnus to establish the relationship.

Dr Chatley (Google) suggested such a programme may lead to greater quality events and provide more confidence in the relationship.

Mr Goldsack (HP Laboratories) shared that HP had been refused access to Cambridge's job advertisement scheme as non-members of their partnership scheme and there was general consensus that charging for access to students was unfair on the students.

Currently the Department of Computing is on the supply-side for Industrial Placements, however, Dr Chatley questioned whether this would always be the case. The proposed partnership programme would not prevent student and company choice but the aim would be to facilitate the relationship to increase quality.

Professor Berry (IBM) commented that if such schemes came into operation at several of their key University partners it would become very expensive to access students. Companies are also recruiting from more than one discipline (e.g. Mathematics and Physics) so a University-wide partnership scheme may be considered to prevent paying more than once.

(b) Industrial Placements for Masters Students
Dr Knottenbelt explained that Industrial Placements were under consideration for Masters students. The Board felt the timing of placements was key, as a placement too early in the course would not be considered beneficial. There was also a feeling that placements should be a minimum of 6 months as 3 months is considered too short to be useful to either the company or the student.

Professor Sloman commented that EPSRC funding for Knowledge transfer via Industrial Placements may continue.

It was explained that Industrial Placements for PhDs would take place during the problem solving part of the PhD. There was support from IBM and HP Laboratories, however, it was noted that funding of research placements is a challenge. A placement may make PhDs more attractive - employability can be a key concern for PhD students.

Dr Mike Rodd (BCS) explained that BCS experience suggested that some companies are not interested in taking students on placement despite placements being key to future employability.

6. Feedback on Format of Meeting

It was agreed that the Board should meet either once and twice per year.

It was suggested that the Board consider how to protect the future of the Department of Computing brand.