

## **Industrial Liaison Board, Department of Computing**

26<sup>th</sup> May 2011  
5pm  
Billiard Room, 58 Prince's Gate  
South Kensington Campus

### **Minutes**

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#### **Present:**

External: Mr Mark Baker (Mind Candy), Mr Paul Clarke (Ocado), Mr Josphe Do (Formicary), Mr Andrew Eland (Google), Dr Krisztian Flautner (ARM Ltd.), Mr Patrick Goldsack (Hewlett-Packard Laboratories), Mr Francois-Xavier Lecarpentier (Orange Labs), Mr Simon Holden (Morgan Stanley), Dr Bill Mitchell (BCS), Professor David A. Oxenham (Dstl), Mr Jon Page (Imperial Innovations), Mr Christophe Tcheng (Amadeus), Dr Andreas Tsiotsias (IBM).

Internal: Professor Susan Eisenbach (Head of Department), Mrs Anne O' Neill (Department Operations Manager), Dr Tony Field (Director of Undergraduate Studies), Dr Krysia Broda (Director of Postgraduate Studies), Dr William Knottenbelt (Industrial Liaison Co-ordinator), Professor Paul Kelly (Group Leader, Software Performance Optimisation), Miss Amy Allinson (Industrial Liaison & Student Support Officer).

**Apologies:** Mr Mike Butler (Deutsche Bank), Dr David Jeffrey (Betfair), Mr Hugh Proudman (IBM), Professor Daniel Rueckert (Director of Research, Department of Computing), Professor Morris Sloman (Deputy Head of Department).

#### **Agenda Item**

##### **1. Welcome and Introduction**

Professor Susan Eisenbach welcomed all attendees to the meeting 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*. The following were welcomed to their first meeting; Mr Mark Baker (Mind Candy), Mr Paul Clarke (Ocado), Mr Joseph Do (Formicary), Mr Francois-Xavier Lecarpentier (Orange Labs), Mr Jon Page (Imperial Innovations), and Dr Andreas Tsiotsias, representing IBM in place of Mr Hugh Proudman for this meeting.

Professor Eisenbach explained that an initial three year membership term has been introduced to ensure a wide variety of expertise on the Board and the Terms of Reference, *Paper 2*, had been updated to reflect this.

## **3. Minutes of the Last Meeting**

The minutes of the last meeting held on 29<sup>th</sup> June 2010, *Paper 3*, were approved.

## **4. Matters Arising**

Professor Eisenbach reported that College now has software to support discussion forums which include members external to the College. Board members will be contacted shortly to register (2010 minutes, item 3.).

Professor Eisenbach reported that the Department was not successful in the bid for a Centre of Doctoral Training and thanked all those that had provided letters of support. The Centre was awarded to The University of Manchester (2010 minutes, item 6c).

Dr William Knottenbelt provided an update on entrepreneurship initiatives later in the meeting (2010 minutes, item 8).

## **5. Strategic Issues**

### **a) Fees and Funding**

Professor Eisenbach reported that tuition fees for undergraduates from 2012 entry will rise from £3,000 per year to £9,000 per year. She went on to explain the specific challenges that we anticipate as outlined in *Paper 4, attached*.

Previous increases in fees have not resulted in changes in application rates but this increase is unprecedented in its amount and the picture for admissions for 2012 entry is uncertain. Reviewing our current applications Professor Eisenbach highlighted that the Department of Computing has a high proportion of students from the EU, almost equal to the number of Home applicants, with the highest proportion coming from Eastern Europe, in particular Romania and Poland. The proportion of EU applicants to Computing is higher than other Imperial engineering departments. It was also noted that students from the EU, and Romania in particular, are amongst our highest performers. The Department is committed to admitting the best students regardless of fees status and is concerned that the substantial increase in fees will deter very good applicants from the EU from applying. It is possible that even wealthy applicants from

the EU may be deterred as they may consider other comparatively expensive education systems including the US.

Industry wants to employ our brightest and best so it was noted that this may also have an impact on recruitment at Graduate level, which needs to be considered. A new partnership between Durham University and KPMG, where KPMG will pay the student's University fees in return for signing them up for graduate employment, was cited as an example of a new model of industry engagement which may be seen more often.

Professor Eisenbach went on to outline a second concern regarding MSc admissions and the impact on PhD admissions thereafter. MSc fees currently stand at £5732 which is lower than the new tuition fee for the fourth year of the MEng. Maintaining MSc fees as they are may therefore cannibalise our flagship MEng degree course as financially it would make more sense for students to complete the BEng followed by the MSc, or leave after the BEng if they secured a graduate role through a summer internship between the second and third years. There would be no Industrial Placement through this route.

It will be necessary to increase MSc fees, however, it was noted that, as with the undergraduate programmes, we again have a heavy proportion of MSc applicants from the EU with French, Greek and Romanian being the most represented nationalities.

In light of these challenges the Board was invited to discuss what steps the Department should take to maintain our current high quality student intake.

Referring to the KPMG Durham University model Mr Simon Holden (Morgan Stanley) suggested that Industry is likely to adopt a 'wait and see' policy regarding the effect on graduate recruitment and that something would need to kick start a 'feeding frenzy' for school leavers.

Dr Krisztian Flautner (ARM Ltd.) noted that in the US sign-on bonuses, typically \$10-20k, are commonplace and there is no commitment after graduation. The culture of accumulating debt for education is the norm in the US.

In response to queries from Board members Mrs Anne O'Neill noted that there is a lack of scholarships and financial support from the College for EU and OS students and no strong history of an alumni endowment to support such initiatives.

Mr Patrick Goldsack (HP Labs) commented that HP readily recruit across Europe and overseas and would still be confident of recruiting good graduates even if they were educated at home instead of in the UK. This was echoed by Mr Christophe Tchong (Amadeus) who stated they look for the best graduates wherever they come from and if quality drops employers will adjust their recruitment strategies and look elsewhere. It was also noted that the best qualified graduates and those most appropriate for business are not necessarily the same thing. Mr Andrew Eland (Google) pointed out that Google has recruited many Eastern European graduates and they tend to prefer to be located in the Zurich office to be nearer home.

Mr Joseph Do (Formicary) noted that with an average starting salary of £35k for an MEng graduate the debt they would take on to complete an Imperial Computing degree would be a good investment and it will be important to advertise this message.

Following on from this Mr Eland suggested that a starting salary guarantee could be made for the MEng course based on assurances from the Industrial Placement.

Professor David Oxenham (dstl) suggested looking to industry for applicants, i.e. run degree programmes for employees. It was noted that the Department had considered this previously but the partner company went out of business so the venture failed.

Board members suggested leveraging overseas fees but it was noted that individual departments have no control over the level at which overseas fees are set.

#### b) Enhancing PhD Impact

Professor Paul Kelly was invited to introduce the discussion on increasing PhD impact as outlined in *Paper 5, attached*. Professor Kelly summarised some PhD success stories. The department graduates +/- 20 PhDs each year but not all have such impact and he questioned whether we should be asking why. He invited comment on the challenges of maximising the value and impact of our PhD students.

Professor Oxenham questioned the impact the Department is seeking adding that not all world changing research is 'thrilling'. The content may be dull and the PhD research may not advance the research agenda but it may have high added value in an applied sense. He also questioned whether the focus of the PhD should be on the individual or the research.

Dr Flautner commented that the best PhDs ARM hire are hired more for their habits (e.g. finishing things, reasoning etc.) than for the specific content of their PhD research.

Mr Paul Clarke (Ocado) questioned whether parallelism in research is encouraged between PhD students as a possible way to tackle large research challenges. Professor Kelly noted that we have not generally encouraged this as we have found PhDs hard to couple.

Professor Kelly suggested the challenge may be a recruitment and selection issue as recruitment of PhDs is focussed on those who are destined for an academic career. There may be nothing wrong with this per se, however, it is important to ensure we are doing enough for those who decide that they do not want to pursue an academic career following their PhD. Dr Bill Mitchell (BCS) quoted the statistic that only 3% of science PhDs stay in an academic environment. It was proposed that for Imperial Computing PhDs this figure may be higher at 10-20%, however, the majority don't stay in academia. It was noted our PhD completion rates are good, with 84% completing in 4 years and 90%+ within 5 years.

Linking in with the discussions on entrepreneurship it was noted that Stanford PhDs are encouraged to be entrepreneurial and that the US system cultivates an environment where one can try out being an entrepreneur. Professor Oxenham suggested two approaches; the first where one exploits IP that exists in research and the second where one creates an environment to generate IP. Mr Holden pointed out that entrepreneurship is a culture. Mr Flautner agreed, noting that in the US the entrepreneurial drive comes from academics and that Professors are fully involved in start-ups. He suggested reviewing the research topics PhDs are working on to encourage spin-out and also considering these areas when recruiting faculty members.

He suggested that supervisors drive entrepreneurship as much as entrepreneurial students and faculty enthusiasm can be quite infectious. Dr Krysia Broda noted that much of our research is applied and could be leveraged in this way. In follow up Dr Mitchell highlighted that when setting applied research topics Faculty should consider whether the research problem is driven by wanting to set up a company or, by impact on industry. Dr Broda noted that American PhDs are longer allowing more space for forward planning and entrepreneurship.

c) Entrepreneurship

Dr William Knottenbelt introduced the discussions by summarising the current situation and our proposals for introducing entrepreneurship into the curriculum, *Paper 6, attached*. He noted that Stanford has spun-out 3000 companies in the past decade, whilst in the same period Imperial has launched only 59, mostly in the life sciences arena. MIT runs a \$100k competition which has resulted in 120+ new start-ups since 1990 with a market capitalisation of around \$15 billion. Imperial is ideally situated to make more of its position as a leading University in one of the world's most influential financial markets. Attracting the brightest and best students relies on the Department being able to offer opportunities for students to develop their skills in a wide range of areas including entrepreneurship.

Mr Jon Page (Imperial Innovations) explained that relatively few of the companies Imperial Innovations have fostered and invested in have come from the Department of Computing. They have recognised that the numbers are lighter than they might be and are looking at addressing this going forward.

Various members of the Board cited examples of other UK entrepreneurship initiatives including; the University of Bristol New Enterprise Competition, the Royal Academy of Engineering who run an Innovation Hothouse, and Seedcamp, set up by venture capitalists and targeted to students.

Mr Clarke noted that entrepreneurship may not be something that can be taught and that consideration be given to recruitment of both students and staff to encourage more entrepreneurial activity.

The Board was generally supportive of the drive to incorporate a framework for entrepreneurship within the student experience. Professor Eisenbach noted that there was more support amongst Board members for delivering this to taught course students than to PhDs.

## 6. Industry Presentations

The following Board members presented on 'important technological trends and developments: ideas for joint research projects and teaching innovation':

- a) Ocado – Mr Paul Clarke, Head of Routing, Delivery, Mobile and Simulation systems  
*Paper 7, attached*
- b) Mind Candy – Mr Mark Baker, Technical Lead  
*Paper 8, attached*

Both presentations referred to the importance of graduates having a solid foundation in computing to ensure they can work with different technologies as industry changes. There was also alignment in the current trends they highlighted, including wider use of scripting languages such as Python and Scala, mobile development and the increased use of open source. They would also like to see students and graduates with greater exposure to agile techniques such as scrum. On the research-side they highlighted specific interests in large scale distributed systems, testing and AI.

## **7. Close**

The meeting closed at 7.15pm.