Department of Computing

Imperial College London

Industrial Advisory Board
Tuesday 23rd May 2023 | 16.00 – 18:00
The Ballroom, 58 Princes' Gate, South Kensington, London SW7 2PG
Dinner will be served in the Garden Room
To email the board members use: dociab-CO@groups.imperial.ac.uk

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Attending

Internal	Michael Huth (Head of Department), Will Knottenbelt (Director of Industrial Liaison), Anandha Gopalan (Director of Studies: PG), Tony Field (Director of Studies: UG), Anne O'Neill (Department Operations Manager), Jackie Bell (Senior Teaching Fellow), Robert Chatley (Director of Software Engineering Practice), Alessandra Russo (Deputy Head of Department)
External	Alexandros Papspyridis (Microsoft), Philip Miller (Solidatus), Claire Vishik (Intel), Nabil Alsabah (msg global), Pinar Emirdag (J.P Morgan), Raymond Mulligan (Scotiabank), Dan Olley (Dunnhumby), David Sharp (ex-Ocado Technology), Emma Perry (BAFTA), Patrick Herbant (Amadeus), Chris Blatchford (Kingfisher), Dan Beimborn (QRT), Burim Bivolaku (ICE)
Apologies	Amit Gawali (WillisTowersWatson), Bryan Lillie (Capgemini), Tom Curtin (Industrial Liaison Officer), Peter Pietzuch (Director of Research)

Agenda

1.	Welcome and introductions by Prof Michael Huth (Head of Department)
2.	Matters arising from previous minutes (all)
3.	Departmental update (Head of Department)
4.	Discussion: IAB feedback on Computing 2030 (all)
5.	Experience report from placements (Dan Beimborn)
6.	~~Education and technical transformation in industry (Chris Blatchford)~~
7.	AI-enhanced education, research, and innovation: update (HoD) and discussion (all)
8.	Imperial's People Strategy and First-Gen Students (Jackie Bell)
9.	AOB
10.	Closing

Minutes

- Michael introduces terms of reference

- Members introduce each other
Anandha, Burim (ICE), Bryan (CapGemini), Alexandros (Microsoft) on Zoom call

David Sharp is now at Kaikahu

3. HoD Update

* Education: President Hugh Brady is launching new strategy; going to look at replacing JMC degree with new Maths/Computing degree with streams such as Quantum Computing etc.

Questions about strategic growth in student numbers and areas of focus.

Quality of teaching and lab space is not good; Huxley building may not be viable going forward so might expect to move to new buildings (possibly on different site) in 5 years.

DUGs role has been advertised.

* Research: Large research calls being released in AI and Communications; staff are stretched to respond

Centres for Doctoral Training bids: 5 are through to the final stages; hoping that one or two might come through since these are vital to healthy PhD recruitment.

Eric and Wendy Schmidt have donated fellowships to support Imperial X, and there is a new MSc focused on AI & Innovation

Intend to bid for large GPU clusters for AI via UKRI

Alexandros noted the importance of large language models; Michael noted the need to deliver facilities at scale via multiple providers while College is also delivering via Research Compute Services; demand is bursty around e.g. conference deadlines; Philip noted the importance of also providing facilities to store and manage data rather than just focusing on compute facilities; Michael mentioned some of the difficulties around data protection law and compliance.

* Innovation: Department has had success with start ups particularly those based around machine learning and transformer technologies; rich ground for innovation going forward; aim to embed more innovation into our taught programmes

4. Computing in 2030:
Department aims to support curiosity-driven high risk research while also supporting applied research to address practical issues in areas such as security, scalability, sustainability. Important to attain and sustain critical mass in key research areas such as machine learning which can act as a key driver of digital innovation. Growth anticipated across core computer science (e.g. post-quantum cryptography), computer systems (e.g. secure & sustainable computing), machine learning (including quantum machine learning and foundations of generative AI), human data science (including regulation and ethics for computing, data science
and AI for health) etc.

Philip: in context of new joint degree with Mathematics, what degree of focus will there be on data science? Michael: likely to be optional area of focus; we have to consider how we retain distinctive offerings which will appeal to key target audiences given constraints in terms of human and physical resources.

Philip: South Ken campus is big draw for students; important that any new campus is as attractive for students. There is a lot of prime real estate that is underutilised. Michael: noted; ambition and support for innovation is also a draw for students.

Alexandros: There could be scaling issues and difficulty coordinating research and teaching activity on account of fragmentation of space. Michael: managing staff across sites posed challenges; need to make sure we are resilient and resistant to fads in terms of retaining diversity of research expertise.

Raymond: size and scale of tech facilities required to support research and teaching is substantial and growing.

Pinar: cryptography is become more of a commodity; there appears to be a big gap in terms how we productise research and maybe there should be more focus on this. Michael: this is a key area; incorporating innovation into our taught degrees is a priority; there is a lot of innovation around zero knowledge proofs and so on is going on in the blockchain space.

David: product engineering is a critical emerging discipline; hasn't quite caught up with classical engineering in terms of rigour but could be interesting to consider it as an area of focus Pinar: engineers should have a combined appreciation of product and engineering.

Raymond: It is critical for product people to have good engineering awareness and vice verse.

Rob: Is it better to teach product people more about engineering or the other way around?

Philip: Practical experience is very important in vital and group project work with real clients is vital; design thinking has a role but it's not enough.

Emma: Important that our students gain experience of collaborative environments in which opinions of all stakeholders (including designers, product people and arts-focused) are respected.

Philip: Can be insightful to study both failures and successes; should not focus only on the successes

5. Dan Beimborn: Report on placements (Imperial students at Qube RT)

Have hired or placed 18 students in 2023

Look for evidence of strong motivation and passion for the subject matter; important that students retain flexibility and can deal with challenges to their thought process; also need effective problem solving approach.

Domain knowledge in core computer science is key; low-level design (C, C++, Linux Kernels) are key.

Group projects are vital to the development of collaboration and social skills despite the students not always enjoying them.

Key competitors are seen as Manchester, Durham and Warwick

We need to be careful that we are not overfocusing on ML & AI to the exclusion of fundamental design and algorithms.

Need deeper dive into Linux and Open Source

Philip: Placement duration rumoured to being reduced; hopes this is not the case.

Dan: 6 months is bare minimum.

Will: What are the most effective channels for engaging with the students? Dan: ACI talks and word of mouth referrals.

Michael: Drawing attention to College's policy on ChatGPT and other AI tools; bearing in mind we have a much larger points of assessment than many other disciplines; trying to develop automated tools to spot generated content is one possible focus of College-level committee Philip: perhaps we should engender in students the idea that they can consult as many tools as they like but they need to hand in their own work; need to be taught how to use tools effectively Michael: indeed how should these tools be included in our teaching?

Nabil: Environments like IntelliJ already completes code for you; but the difference here is that now code can be generated from comments; and if they are just standard algorithms why not?

Raymond: There is a real risk from hallucination (generation of apparently plausible content which is actually inaccurate or made up); which is difficult for non-experts to spot; Philip: requires emphasis on fundamental thinking skills and perhaps a different style of examination David: Could it be used in marking? Michael: Teaching students how to use tools to for example improve their writing could be insightful for them.

8. Jackie: Imperial's People Strategy and First-Gen students
Focus of Imperial strategy: Finding and developing diverse talent (e.g. reaching best candidates, considering diverse range of backgrounds and skills, recognising achievements and contributions, enhancing career progression, closing pay gaps), creating an inclusive culture (e.g. support for staff, encouraging positive behaviours, elimination of bullying and harrassment), building a resilient workplace (e.g. flexible working, supporting health and well-being, listening and responding to staff).

Department-specific goals: broadening collaboration, embedding values, more scholarship support, internal training and talent retention, social activities (especially for postdocs)

Students from disadvantaged homes where there is no tradition of higher education are more likely to drop out nationally.

In a survey of belonging, only 4% of students mentioned the department as a community they feel connected to - a worrying statistic.

Successful launch of summer residential program for widening participating cohort which is supported by ongoing peer mentoring and 4-week research placements; provides a very valuable interdisciplinary experience; could this be supported by industrial placements?

David: peer mentoring is a very important aspect of the student experience.

Philip: Did COVID have a negative impact on feeling of connection with department?

David: To what extent does Imperial indulge in social engineering? Oxford and Cambridge are turning away my talented students.

Jackie: College does first filter; widening participation is flagged but academic achievement is still primary criterion.

Philip: We need to be aware of competitive threat from US; maybe requires coordinated outreach programmes with ambassadors going into target schools.

Jackie: We are in fact doing such outreach with schools like St Pauls Girls for Schools

Michael: Department is currently being reviewed and strategic insights from it should be available soon.

END.