Proposal: closure of AI&Math and AI&SE degrees

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Summary:

- We maintain a large number of UG degrees, which incurs an administrative cost.
- Many of these degrees have very few students.
- After considering recruitment, academic, and strategic reasons for keeping (or closing) each degree, it is proposed that we close the AI+math and AI+SE degrees. Note that students on the SE degree already have enough flexibility to do almost all choices for AI+SE*, and the CS+math degree can be made slightly more flexible to permit all the same choices as AI+math (see accompanying proposal).
- This would leave us with 9 four-year degrees: 5 single honours (CS BSc and BEng, AI, SE, AI+CS) and 4 joint (CS+Math, CS+Physics, CS+Management, Cognitive Science).
- We may want to revisit the SE, CS+phys, and CS+mgmt degrees for possible closure in future.

*SE students can do all options for AI+SE with two exceptions: they take SELP in year 3 (rather than a choice of LP), and they take a minimum of 20 credits of SE courses in year 4 (rather than a minimum of 10 credits). These differences are minor enough that we propose no changes to the SE degree.

Consultation:

Feedback on earlier versions of this proposal has been incorporated after consultation with Strategy Committee, Helen Pain (Recruitment), Kami Vaneia (E&D), Julian Bradfield (Senior Tutor), Michael Rovatsos (in his former role as director of CISA), Perdita Stevens (re SE), and Bjoern Franke (when DoT).

Details:

We currently have 14 four-year degrees:

- six single-honours (CS BSc and BEng, AI, SE, AI+CS, AI+SE),
- six joint (CS+Math, AI+Math, CS+Physics, CS+Electronics, CS+Mgmt, CogSci),
- and two hybrid (CS with Mgmt, SE with Mgmt).

The CS+Electronics degree has already been closed to new entrants (it's being taken over by Engineering), and the "with Mgmt" degrees are also now scheduled for closure.

That still leaves us with 11 degrees, several of which have very few students (see Table 1 at end of document). Others are arguably not well served by the expertise of our staff. As part of the ongoing review of our curriculum, we should consider whether we need to maintain all of our current degrees.

Having fewer degrees would reduce considerable administrative overhead both during the curriculum review and afterward: fewer DPTs to construct, check requirements for, and maintain; less for PTs to keep track of; fewer constraints to check and satisfy when resourcing courses.

Potential arguments to consider regarding degrees to run/close:

1. Recruitment. Does having the degree improve recruitment (overall, or of underrepresented groups)?

2. Academic. Does the degree provide a sufficiently strong offering, and a sufficiently different offering from other degrees?

3. Strategic. Are there other reasons why having the degree is useful for the School?

We should have a strong argument on one or more of these counts in order to keep a degree running, given the overhead of doing so.

Degrees considered

It's clear from the numbers that the **MInf**, **CS**, **AI+CS**, and **CS+Math** degrees all have a strong recruitment and/or strategic argument (MInf actually has very low numbers of applicants, but lots of students switch onto it later). **Cognitive Science** struggles a bit in terms of our offering, but attracts by far the highest proportion of female students (21/30 current students), and also has strategic reasons (e.g., maintaining ties to PPLS and reputation of Edinburgh in this area). So let's consider the remainder:

Software Engineering:
- Academic: this degree is problematic because it's not clear we really provide a good offering (generally agreed at StratCmte, including by Perdita).
- Recruitment: I don't have numbers regarding applications, but Kami did send me the number of students on our degrees from 2013-2017, broken down by gender. The popularity of the SE degree is declining (9% of total in 2013; 4.6% now), and the proportion of female students on SE is going down, whereas the proportion of female students on other degrees is going up (e.g., in 2013 we had 10%, 9%, and 20% female on SE, CS, and CS+Math; in 2017 we have 6%, 21%, and 36%). So there doesn't seem to be a good recruitment argument here either.
- Strategic: We are currently trying to recruit a Chair in SE so the feeling at Strategy Cmte was that, at least for the moment, there is a good strategic argument not to close the degree. This could be revisited in future depending on the success of the recruitment process.

AI, AI+SE, AI+Math:
- Recruitment: these degrees have very low enrolment (see Table 1), together accounting for less than 8% of our students, so closing them doesn't seem likely to have a big impact on recruitment overall. There *might* be an argument for diversity in favor of the AI degree, which currently has 42% women (compared to 22.7% across all degrees); however the numbers are small (19 students overall) so it's hard to know how significant that difference is. AI+SE has 24% women (basically the same as overall), and AI+math has 28% (out of only 14 students; also note that CS+math has 36%). But even if the numbers on these degrees look slightly better than our average, it still not clear how much of an impact keeping them around is having because they're

so tiny. If we did not have these degrees, our current overall percentage of women would be 22.0% instead of 22.7%.

- Academic: the argument here seems fairly weak. We have other degrees that are extremely similar in terms of requirements, and could potentially be made slightly more flexible in order to accommodate these students. For example, we could make minor changes to the more popular CS+math degree to permit the same paths as the AI+math degree. Also, the AI+SE degree has the same problem as the SE degree in terms of our SE offering.
- Strategic: Artificial Intelligence is an important strength of Edinburgh, and if anything AI is growing in public awareness. We need to maintain our reputation in this area. However, it's not clear that we need these undergraduate degrees in order to do so. Undergraduates who are attracted to AI can still do the AI+CS degree, and we will still offer our (extremely popular) AI degree for MSc students.

Overall, it seems safe to close the AI+SE and AI+math degrees. The straight AI degree is slightly less clear, and it seems safer to keep for now since it might see a rise in enrolment if the other two close.

CS+phys, CS+mgmt:

- Recruitment: no strong argument here, at least in terms of the specific degrees. I've heard an argument that offering a wider variety of degrees looks better to students (though I'm not clear if we have evidence of that).
- Academic: these degrees really are significantly different from our others, so on academic grounds it seems reasonable to keep them.
- Strategic: I don't know of any strong strategic argument.

Overall, I would lean towards keeping these for now. It incurs overhead in terms of liaising with other schools, external examiners, etc. The potential downside of removing them is that we'd no longer have to ensure our pre-honours courses don't clash with physics and management, which might mean someone stops paying attention and we do start clashing. This would make things difficult for students who want to take these courses as outside options, even if not on the combined degree.

Table 1: Enrollment across all UG students on our current set of degrees:

Bold: discussed above. (brackets: already scheduled for closure)

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         count   percent
CS BSc    246  0.332882
MInf       97  0.131258
CS BEng    68  0.092016
AICS       68  0.092016
CSMath     65  0.087957
SE         36  0.048714
Cog        30  0.040595
(CSEl      25  0.033829)
AISE       22  0.029770
AI         19  0.025710
CSPhys     14  0.018945
AIMath     14  0.018945
CSMan      13  0.017591
(CSwMan    13  0.017591)
Ord         3  0.004060
(SEwMan     6  0.008119)
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