Revisions to IPAB Robotics and Computer Vision Courses

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Summary

This document outlines the key considerations behind our recently concluded curriculum review, and the proposed plan of revisions to some of the IPAB course offerings.

Discussions involving Course Organisers, Director of Teaching and others in the School Leadership have identified the following key considerations:

1. We have a few different robotics and vision courses that for historical reasons (including the needs of RAS CDT) have overlaps. This is in of rationalisation.
2. Logistically, we would like to have fewer courses with multiple instructors each, to minimise potential disruptions to teaching allocations and planning in the event of key faculty being unavailable to teach in specific terms (e.g. due to being exempt while on fellowships).
3. We have seen declining student numbers in key robotics courses, at a time when we really wish to attract a broader audience of students who could be interested in an area which continues to be highly relevant and is still growing worldwide.
4. This seems to be affected, at least in part, by the perceived course load involving physical laboratory time required, and the ways in which the courses are targetted specifically at core robotics students (e.g., ignoring the broader pool of AI students less directly interested in hardware)

We propose the following revisions to the robotics courses. This is intended as the first part of a two-stage process for revising IPAB course offerings. This first stage covers core courses that we treat as being essential to anyone claiming qualifications in the robotics and vision area. These courses should also be of broader interest to students in allied areas (e.g., machine learning students who want to gain knowledge of robotics). In a subsequent second stage (likely to be brought to BoS for discussion in the first half of 2022), we will address specialist courses (e.g., Robot Learning) that are essential for the health of the research field within IPAB and Informatics, but whose target audience is more narrowly defined.

- IAR, IVR and RSS will be replaced by two new courses, Introduction to Mobile Robotics, and Advanced Robotics. These courses can be taken in sequence.
- The vision component of IVR and AV will be revised and rationalised to create a single 20 points computer vision course. We envision this as a year-long course, covering 'traditional methods' and basics in the first semester, then focussing more on modern deep learning based methods in the second semester.
- Computer Graphics will continue to be taught in its present form, and it will continue to be treated as a core course in this area. In the second stage, there may be an

Advanced CG course, at which time we could consider the possibility of small content changes to the present course. This will depend also on the ongoing recruitment process for a new faculty member in graphics and simulation, whose inputs we would seek.

The figure below illustrates the plan of courses as envisioned within this review. At this first stage, we are discussing the first column.