Completely Individualized Remote Exams (CIRE)

Pascal Wallisch
New York University
The Problem
Specific challenges and concerns

• Disparate impact of pandemic: ~1/3 of students severely disrupted, ~1/3 somewhat disrupted, ~1/3 largely unaffected.

• This challenges the validity of the exam as a fair and equitable way to measure student understanding.

• If the exam is timed, this puts students in different time zones or students with unreliable internet connections at a disadvantage.

• If the exam is not timed, there is no question that some students will collaborate by sharing answers, giving them an unfair advantage over students who don’t cheat.
The data

How flexible are you willing to be, given the situation - in terms of deviating from the sittyba as envisioned on day 1 of the class?

How important is it to you to still have an exam in some fashion?
The proposal

• Every student receives a completely individualized, idiosyncratic exam.
• This “exam” is coded up in a scientific programming language and delivered remotely, hosted on a server.
• We leverage randomness, at multiple, hierarchical levels.
• Any given question is randomly picked from a theme (e.g. probability)
• Then, a question type is picked (e.g. conditional probability)
• Then, random categories are picked (e.g. pilots, happy people)
• Then, values are picked at random (e.g. 0.15)
• These values (and more generally, data) are drawn from a randomly picked probability distribution with randomly picked parameters.
Advantages

• Exam can be delivered remotely
• Each exam is completely unique, preventing cheating.
• Yet, each exam is fair and comparable, due to the large number of questions (>50)
• Everything (e.g. reaction time per question) is measured, allowing for evidence-based exam design
• Immediate feedback
• Auto-grading
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