Strengthening assessment integrity of online exams through remote invigilation

<table>
<thead>
<tr>
<th>Question 1</th>
<th>The Unit Outline specifies that the word limit for the Video Business Case Report is 2,000 words. Which of the following options is correct?</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 1,000</td>
<td>B. 2,000</td>
</tr>
<tr>
<td>C. 3,000</td>
<td>D. None of the other answers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 2</th>
<th>The Unit Outline specifies that the 'Human Resources (HR) Module' will be assessed in the Competition Round. Which of the following options is correct?</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. 6</td>
<td>B. 2</td>
</tr>
<tr>
<td>C. 4</td>
<td>D. None of the other answers</td>
</tr>
<tr>
<td>E. 5</td>
<td>F. 3</td>
</tr>
</tbody>
</table>

| Question 3 | Save and Submit |

Lesley Sefcik  
Steve Steyn  
Michael Baird  
Connie Price  
Jon Yorke  
Steve MacKay  
Kim Li
Are online tests and exams the way of the future?

Should institutions adapt their assessment methodologies to technology, or should technology adapt to assessment methodologies?
The Problem

Online global education

- Online assessment has lagged behind online learning
- Potential increases in cheating and fraud risk

Single approach to mitigating assessment risks in online assessments

- Costly for universities and potentially for students
- Limited mitigation of risk
  - Additional workload to follow-up suspected breaches of academic integrity
- Primarily a deterrent
Project Aims

- Investigate the feasibility of implementing a locally developed remote invigilation system
  - Reduced system costs?
  - Low technical support requirements
  - Less-intrusive
  - Ease of use
    - Students
    - Unit teaching staff
  - Estimate workload to follow-up suspected breaches of AI
  - Opportunities to co-develop a solution using an agile approach
CRIS
Curtin Remote Invigilation System
Curtin Remote Invigilation System (CRIS)

Asynchronous authentication of student identity and monitoring during online assessments

- Browser based plugin
  - custom Chrome web browser extension
- Recording student behaviour
  - webcam
  - microphone
  - screen workspace
- Automatic flagging of suspected dishonesty
  - facial recognition
  - volume spikes
- Recordings Review Dashboard
○ Customise the EIT Chrome extension for Blackboard
○ Pilot in one Curtin unit
  ○ Business Capstone
    ○ Unit runs Semester 1 and Semester 2
    ○ Cohorts F2F and fully-online
      ◦ Fully online and OUA
    ○ Flipped classroom
      ◦ 10 x 10 min eTests per study period
      ◦ Choose your own eTests (2 options)
○ Research project to identify student perceptions and ease of use
**Challenge 1**
Ease of use
No downloading large software packages
Staff easy access to flagged results to examine potential misconduct

**Challenge 2**
Integrate with multiple LMS platforms
Avoid creating building blocks
Difficulty when LMS is updated - synchronisation integrity

**Challenge 3**
Comprehensive capture
Students can not take test without proctoring enabled
Password protected
CRIS Implementation - Staff

Recording management dashboard

Flagged frames only

Full Playback
## Semester 1: Data Demographics

<table>
<thead>
<tr>
<th>Demographics</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actively enrolled students in the unit</td>
<td>95</td>
</tr>
<tr>
<td>Unit Recordings (35% of total possible)</td>
<td>421 / 1204</td>
</tr>
<tr>
<td>Students with full consent</td>
<td>52</td>
</tr>
<tr>
<td>Recordings consented for research</td>
<td>159</td>
</tr>
<tr>
<td>Student experience surveys</td>
<td>32</td>
</tr>
<tr>
<td>Flag Category</td>
<td>n</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Hand on/near face or head</td>
<td>77</td>
</tr>
<tr>
<td>Looking down/away from screen</td>
<td>59</td>
</tr>
<tr>
<td>Full face not showing in frame</td>
<td>49</td>
</tr>
<tr>
<td>Background flagged for facial recognition</td>
<td>42</td>
</tr>
<tr>
<td>Hat/earphones on</td>
<td>13</td>
</tr>
<tr>
<td>Bright background/shadowed face</td>
<td>11</td>
</tr>
<tr>
<td>Public space/another person present</td>
<td>10</td>
</tr>
<tr>
<td>Moved out of the frame/room</td>
<td>2</td>
</tr>
<tr>
<td>Non-test screencapture</td>
<td>1</td>
</tr>
<tr>
<td>Answered the door</td>
<td>1</td>
</tr>
</tbody>
</table>

Why were students flagged?
Staff Workload

- Will vary according to time and number of eTests
  - Roughly 1 min per student per eTest currently
    - Time required if student follow-up is necessary; if, for example, students are not following eTest rules, camera is side-on etc.
  - Time for CRIS instruction setup - 1-3 hours
    - Includes putting links to CRIS in LMS, instruction sheets, demo eTest (if required)
  - Student Queries/Concerns - < 1 hour (fewer than expected!)
Student Perspective: Level of comfort with remote invigilation

N = 32
1. **Enforcement** - ensuring students use CRIS
2. **Assessment synchronisation** - start and stop of CRIS while linked to assessment
3. **Upload redundancy** - closing browser, or experience internet connection issues
4. **Flagged frame sensitivity** - flagging of normal behaviour
5. **Event log** - information on states and actions for debugging CRIS
Future work

1. **Configurability** - allowing further selection and configuration of features
2. **Smart Flagging** - Embedded intelligence for real-time human-like verbose guidance
3. **Desktop flagging** - Tab and application switching
4. **Bandwidth benchmarking** - testing student bandwidth to give estimate of upload duration
5. **Identity check** - Student ID vs webcam feed verification
6. We want to collaborate
7. Have a go!
Questions?