EDTECH

Sandbox Series

Beyond Surveillance: The Case Against AI Detection and AI Proctoring

Ian Linkletter

British Columbia Institute of Technology

September 18, 2024

10 a.m. - 12 p.m.

BCcampus

CC BY NC NO AI

I would like to acknowledge that I live and work on the traditional, ancestral, and unceded territory of the Coast Salish Nations of Sḵwx̱wú7mesh (Squamish), səl̓ilwətaʔɬ (Tsleil-Waututh), and xwməθkwəy̓əm (Musqueam).

Session Overview

- The Case Against AI Surveillance (40-60 minutes)
- Facilitated discussions (40-60 minutes):
  - Questions and Reflections
  - Experiences and Anecdotes
  - Talking to Students about AI
  - Working Against Surveillance
  - Moving Beyond Surveillance
  - Fairness and Integrity
- Algorithmic Impact Assessment Hands-On (20 minutes)
- Reminder

My background

- The Evergreen State College, BA
- The University of Western Ontario, MLIS
- Educational technologist for 15 years
- Worked in UBC's Faculty of Education for 10 years
- Sued by Proctorio in 2020
- Now an Emerging Technology and Open Education Librarian at BCIT
- Recently created the Canadian Privacy Library
- "Do no harm" is my fundamental principle

The **Case** Against:

AI Proctoring and AI Detection

Links: https://bit.ly/beyondsurveillancelinks

Academic surveillance software

- Academic surveillance software monitors student behaviour
- Educational technology serves a pedagogical purpose
- Surveillance technology has no place in education
- We can work together against surveillance
- 2024 can be the year we move **beyond surveillance**

Surveillance demonstrates values

Power and control over teaching and learning

A classroom without mutual trust is not a good place to be

Surveillance sends a message

- You are not trusted.
- We are watching you.
- You can be removed.

Ethical criticisms of GenAI apply to AI surveillance

1. Model Bias
2. Environmental Impact
3. Privacy Concerns
4. Copyright

Two useful libraries by Charles Logan

- Against School Surveillance Technologies Library: https://docs.google.com/spreadsheets/d/1jdulo4LzswhN6xYCI4GvnpCdBdpu6zlPfi01yDOBwDU/edit?gid=572288548#gid=572288548

- Against AI and its Environmental Harms Library: https://pad.riseup.net/p/Against_AI_and_Its_Environmental_Harms-keep

Academic Surveillance Software

AI Proctoring

- Mandated spyware used during remote exams
- Exploded in use during the pandemic
- Monitors bodies and behaviour
- Surveils webcam, microphone, web browser
- Room scans were found unconstitutional
- A spectrum from 100% AI to human-assisted AI

Source: https://www.npr.org/2022/08/25/1119337956/test-proctoring-room-scans-unconstitutional-cleveland-state-university
Synthetic image.

Abnormalities

- Compares each test taker's behaviour
- Outliers get a higher suspicion score
- Outliers are flagged

Abnormalities

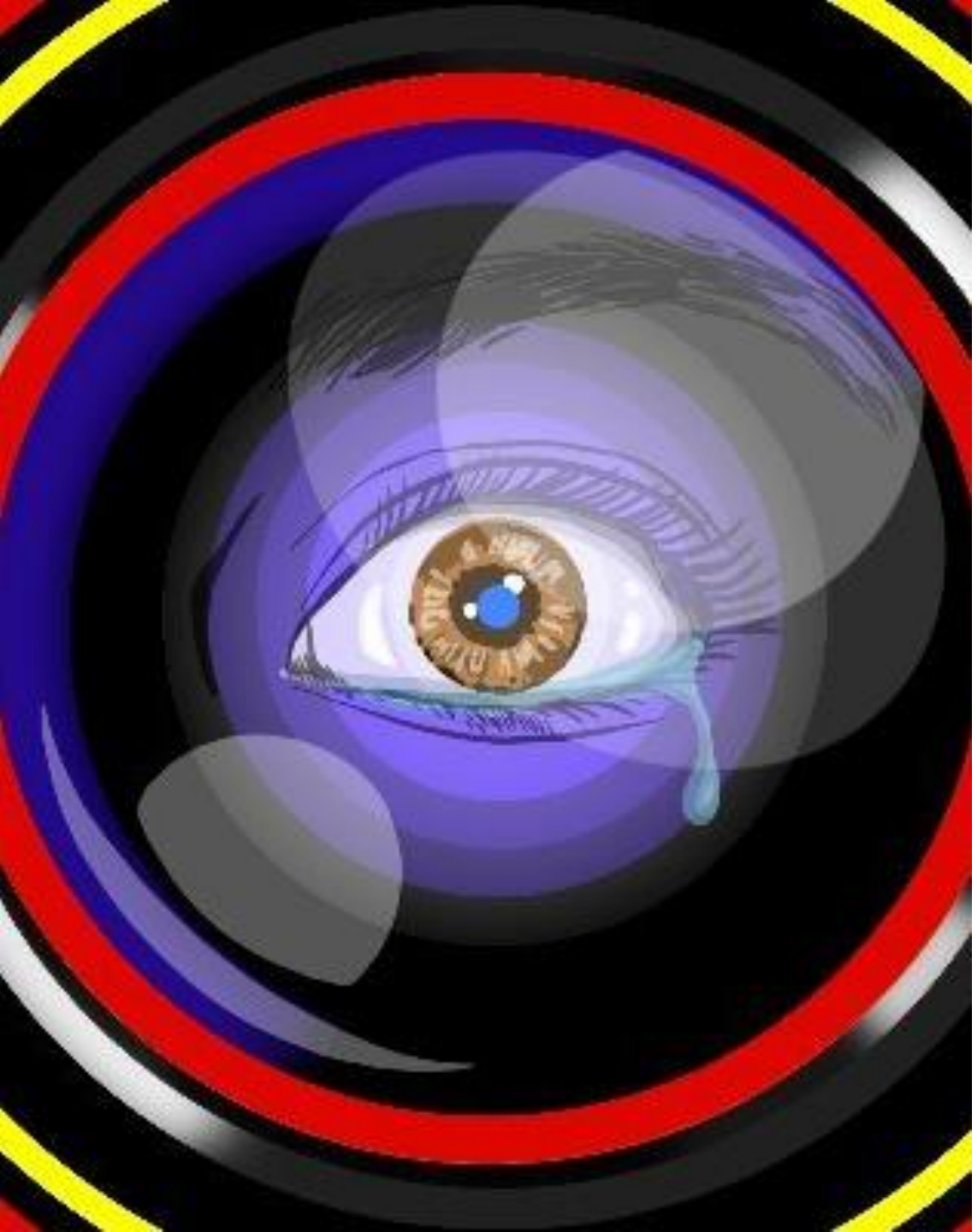
"One system, Proctorio, uses gaze-detection, face-detection and computer-monitoring software to flag students for any “abnormal” head movement, mouse movement, eye wandering, computer window resizing, tab opening, scrolling, clicking, typing, and copies and pastes. A student can be flagged for finishing the test too quickly, or too slowly, clicking too much, or not enough."

Source (Gift Link): https://wapo.st/4esCN33

Abnormalities

- Changes in audio levels
- Clicking
- Copy and paste
- Exam duration
- Eye movement
- Head movement
- Number of faces
- Mouse movement
- Keystrokes
- Reloading
- Switching networks

Source: https://twitter.com/ejohnson99/status/1303142450828054529



AI makes proctoring especially harmful

- Discrimination against disabled students.
- Discrimination against students of colour.
- Unwarranted invasion of privacy.
- Causes emotional harm.

Source: https://www.twitter.com/Procteario

Discriminatory algorithms

Inaccessible to blind students (room scan and screen readers)

Kicks you out if you are away from your computer (i.e. bathroom break)

Eye and head movement tracking targets neurodiverse students

Minimal movement causes stress

Kicks you out if it detects another face

Facial detection software is biased

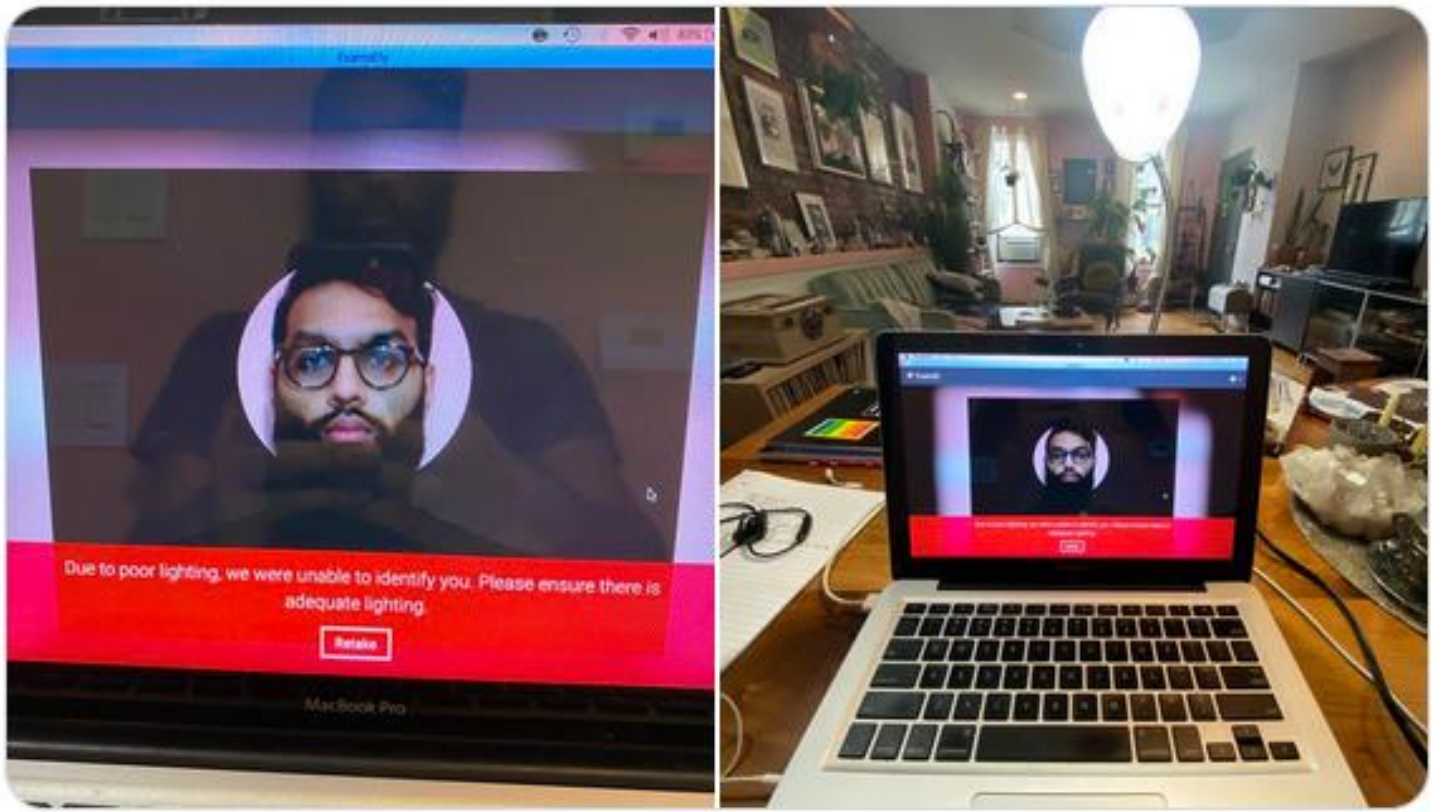
Face not found: Students of colour have for years reported problems being recognized by the facial detection software and being blocked, flagged, or removed from exams as a result.

"Imagine all you want to do is take a test, and the system your institution uses as a gateway to testing doesn't recognize you as a human being." - Dr. Chris Gilliard

Find Chris on Bluesky: https://bsky.app/profile/hypervisible.bsky.social

@uhreeb

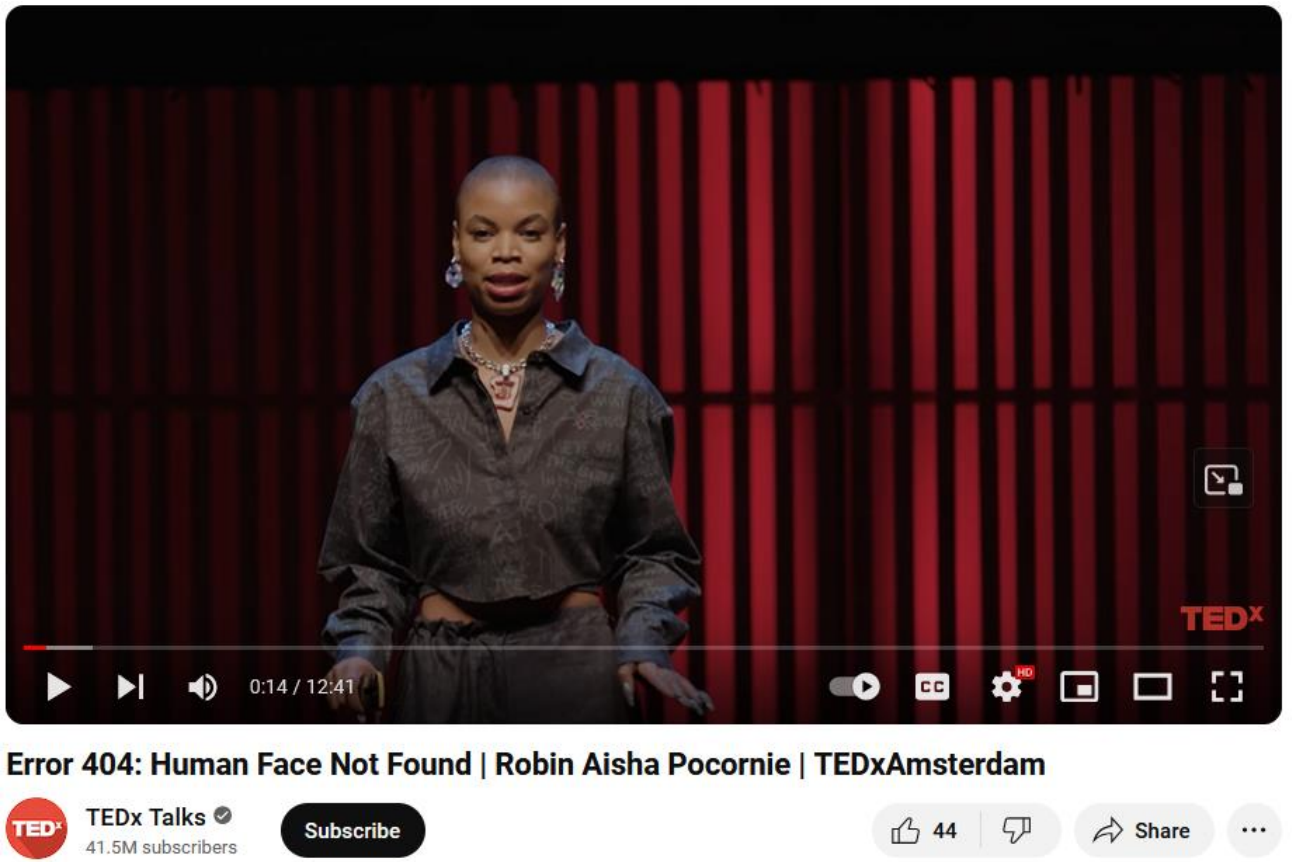
Ok @ExamSoft support told me to “sit directly in front of a lighting source such as a lamp.” I’m receiving the same issue preventing me from completing the NY UBE mock exam. Facial recognition technology is racist. @DiplomaPriv4All do y’all think I have “adequate lighting”?



9:05 AM · Sep 11, 2020

Source: https://x.com/uhreeb/status/1304451031066083331?lang=en

Robin Pocornie's story



Video: https://www.youtube.com/watch?v=pVfvYYUkIcY

Amaya Ross's story

Video: https://www.youtube.com/watch?v=iELUtvhbukE

glazed donut🍩
@WHO_isKenny

This happens to me using @proctorio 😡

>
> **Janice Wyatt-Ross, EdD** @JaniceWyattRoss · Feb 22, 2021
> Daughter 1 was taking an exam today being proctored by some type of software that apparently was not tested on dark skin. She had to open her window, turn on the lights, and then shine a flashlight over her head to be detectable. 😡😡😡

8:38 AM · Feb 23, 2021

Source: https://twitter.com/WHO_isKenny/status/1364253217098457104

Source: https://x.com/cham_omot/status/1364376131516854275

Gavin Gordon had the same experience

"During the pre-test tech check, the software was unable to recognize my face. Being fairly experienced with technology, I tried the usual troubleshooting procedures: using a solid background, making sure I wasn’t backlit, increasing the lighting on my face, trying different angles, etc. Yet it still wasn’t recognizing my face. To ensure that this was not a problem with my webcam, I had my Caucasian roommate try the tech check which instantly recognized his face without any issue... I know that if it happened to me, it's likely happening to other students."

Source: https://ubyssey.ca/opinion/letter-restricting-remote-invigilation-software/

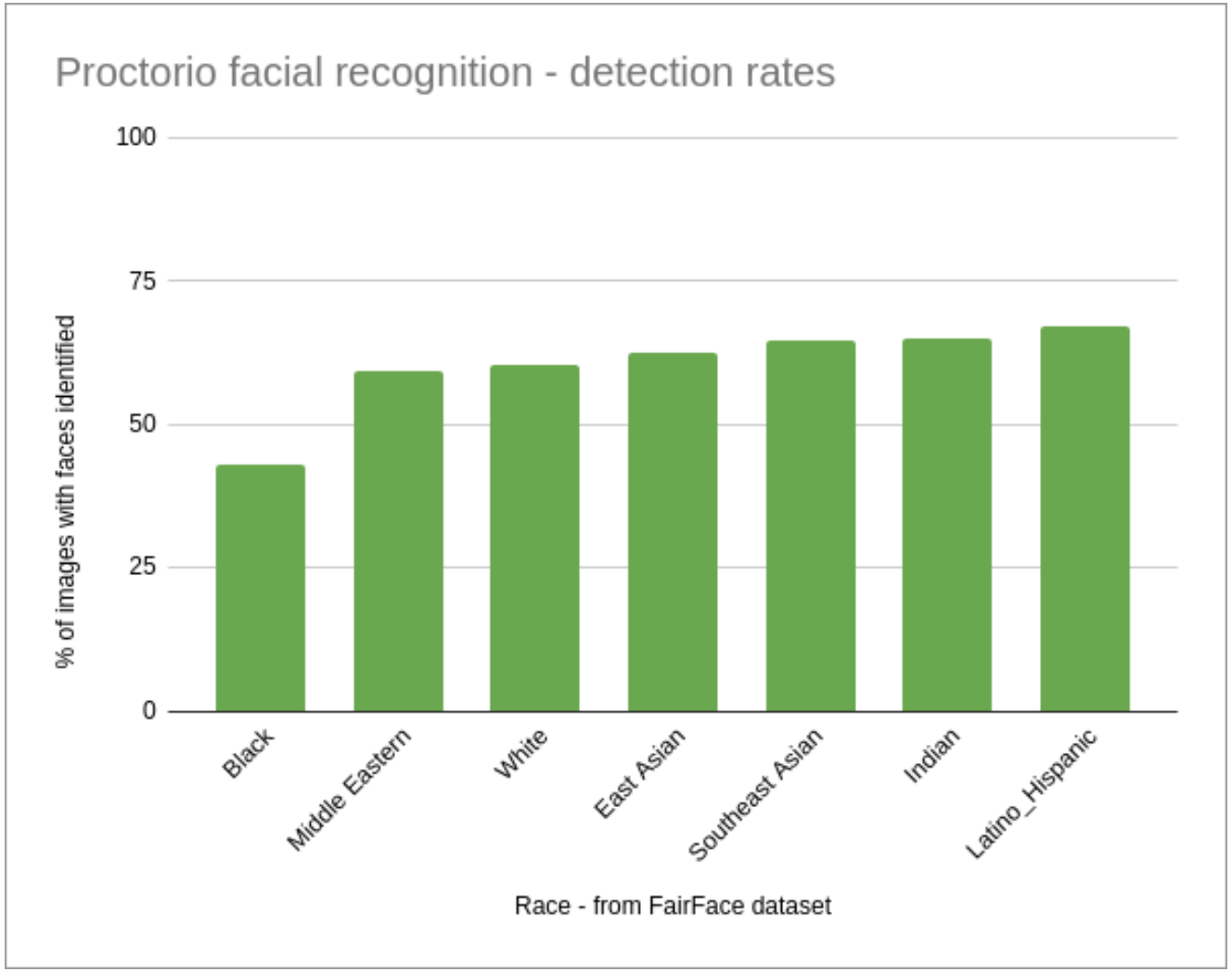
Femi Yemi-Ese also experienced face not found

"Like many test-takers of color, Yemi-Ese, who is Black, has spent the past three semesters using software that reliably struggles to locate his face. Now, whenever he sits down to take an exam using Proctorio, he turns on every light in his bedroom, and positions a ring light behind his computer so that it shines directly into his eyes. Despite these preparations, “I know that I’m going to have to try a couple times before the camera recognizes me,” he said... Adding sources of light seems to help, but it comes with consequences. “I have a light beaming into my eyes for the entire exam,” he said. “That’s hard when you’re actively trying not to look away, which could make it look like you’re cheating.”"

Source: https://www.newyorker.com/tech/annals-of-technology/is-online-test-monitoring-here-to-stay

The root of the problem: biased AI

Lucy Satheesan discovered that Proctorio was using open source facial recognition software called Open CV. She tested Open CV against an open source database of faces called FairFace and found that Proctorio could detect Black faces less than half of the time.



Source: https://proctor.ninja/proctorios-facial-recognition-is-racist

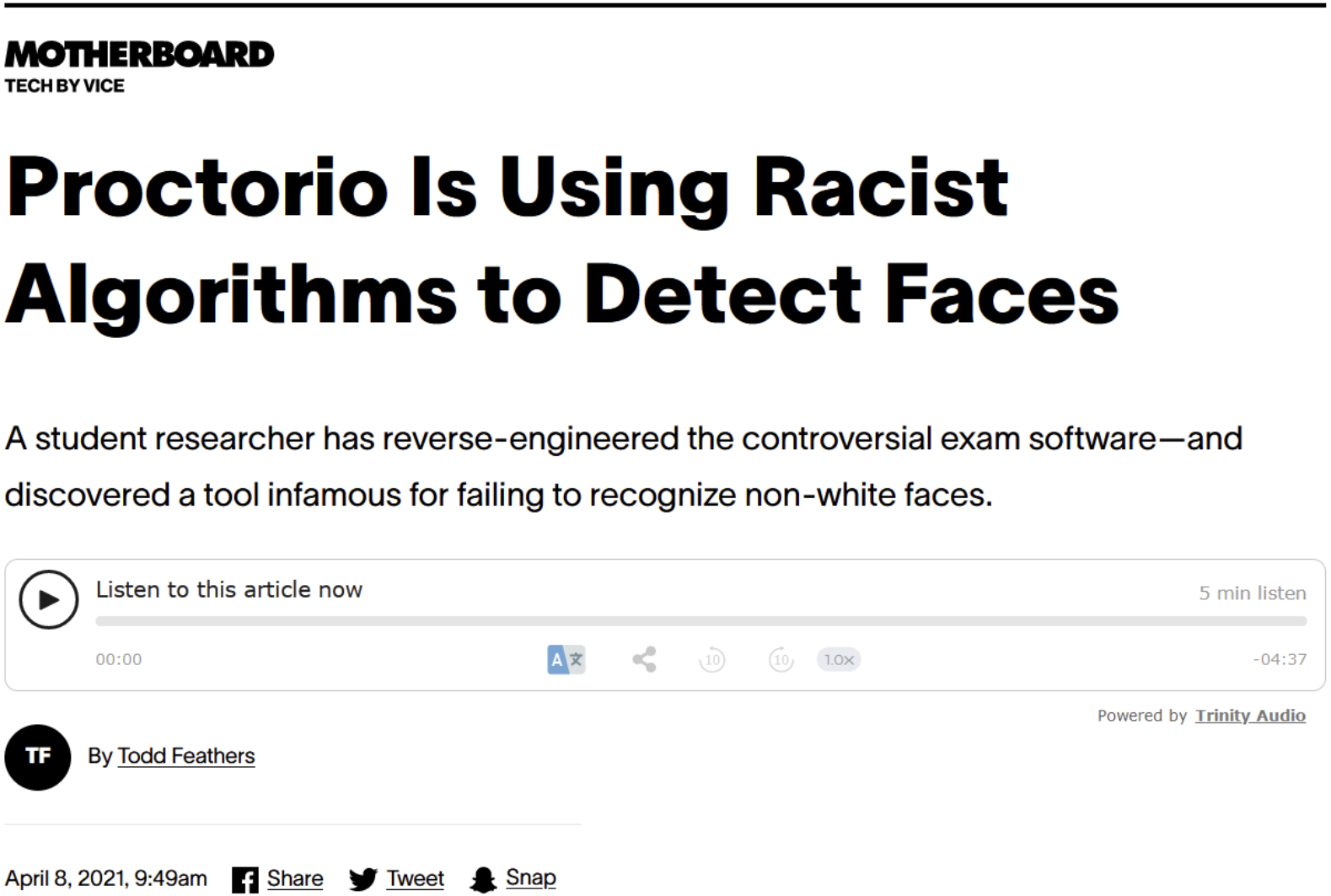
TECH / POLICY

Students of color are getting flagged to their teachers because testing software can't see them / Proctorio reportedly uses facial detection software that failed to recognize black faces over half the time

By Mitchell Clark

Apr 8, 2021, 5:34 PM PDT

Link: https://www.theverge.com/2021/4/8/22374386/proctorio-racial-bias-issues-opencv-facial-detection-schools-tests-remote-learning



MOTHERBOARD
TECH BY VICE

Proctorio Is Using Racist Algorithms to Detect Faces

A student researcher has reverse-engineered the controversial exam software—and discovered a tool infamous for failing to recognize non-white faces.

Listen to this article now
5 min listen
00:00
-04:37
Powered by Trinity Audio

TF By Todd Feathers

April 8, 2021, 9:49am Share Tweet Snap

Link: https://www.vice.com/en/article/g5gxg3/proctorio-is-using-racist-algorithms-to-detect-faces

This problem is known within the industry

- "Respondus, a vendor of online proctoring software, has been granted a patent for their “systems and methods for assessing data collected by automated proctoring.” The patent shows that their example method for calculating a risk score is adjusted on the basis of people’s skin colour.
- The “Adjustment to Final Tally” for dark skin is described as follows in the granted patent:

  For dark complexion persons, a racial detection feature may be provided so that a downward adjustment can be made to the final risk tally."

Source: https://racismandtechnology.center/2023/10/05/proctoring-software-uses-fudge-factor-for-dark-skinned-students-to-adjust-their-suspicion-score/

Questions for our group conversation

Can an algorithm be racist?

How many "face not found" errors are acceptable?

What does it mean to say "AI proctoring is racist?"

How are our institutions protecting students from discriminatory AI?

What does accountability look like?

Proctorio Spend at Ohio State University

Purchase orders:

03/19/2018: $220,000
08/07/2018: $9,000
03/05/2019: $220,000
09/09/2020: $170,000
07/01/2022: $170,000
04/19/2023: $125,000

Overall spend: $465,531.25

Source: Personal Freedom of Information request

Proctorio Spend at University of Colorado Boulder

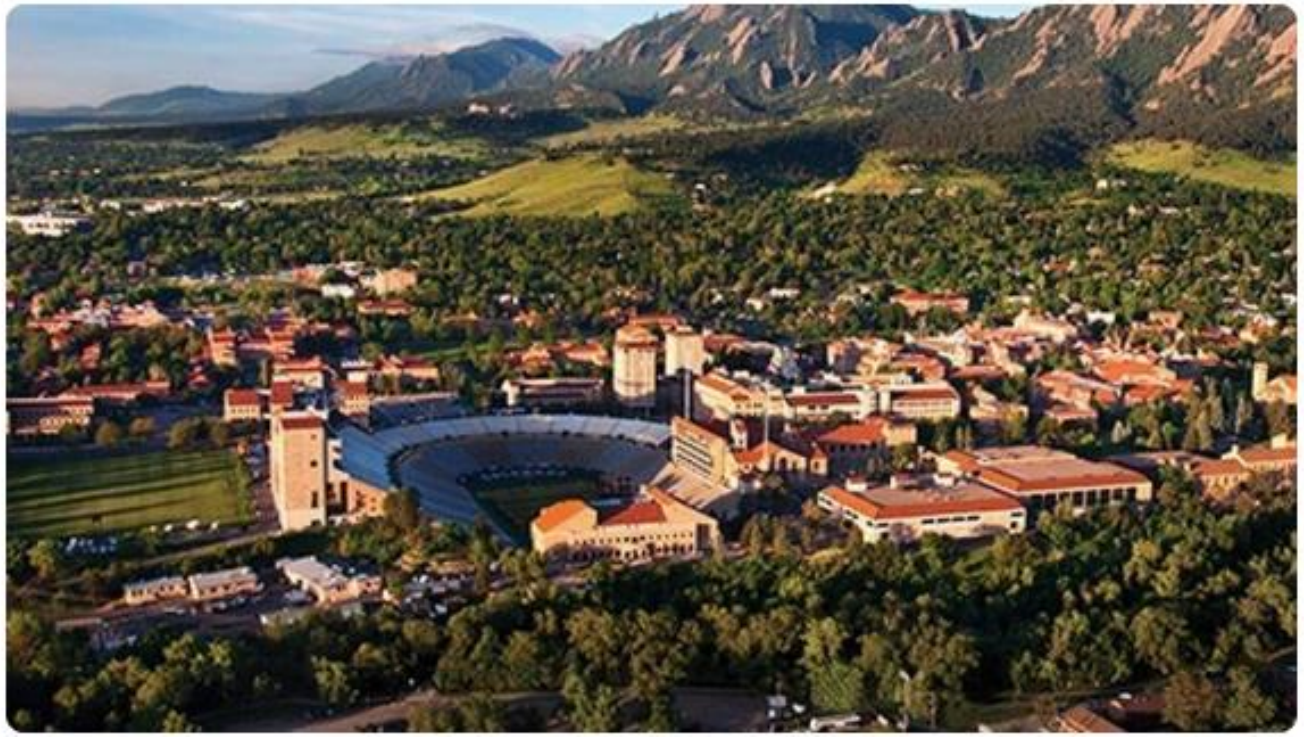
Purchase orders:

2015: $50,000
2018: $4,290
2019: $4,896
2020: $180,448
2021: $180,448
2022: $114,448
2023: $66,732.52
2024: $114,448

Total: $722,491.50

Pricing: $3.68 per user based on the institution's current full-time equivalent enrollment number.
5% of instructors used Proctorio when the institutional contract was discontinued.
Source: Personal Freedom of Information request and https://oit.colorado.edu/services/consulting-professional-services/academic-technology-initiatives-team/needs-assessments/online-proctoring

Stop Use of Proctorio at CU Boulder over Privacy Concerns



Started September 6, 2020
Petition to University of Colorado Boulder

1,403 Signatures

1,500 Next Goal

Support now

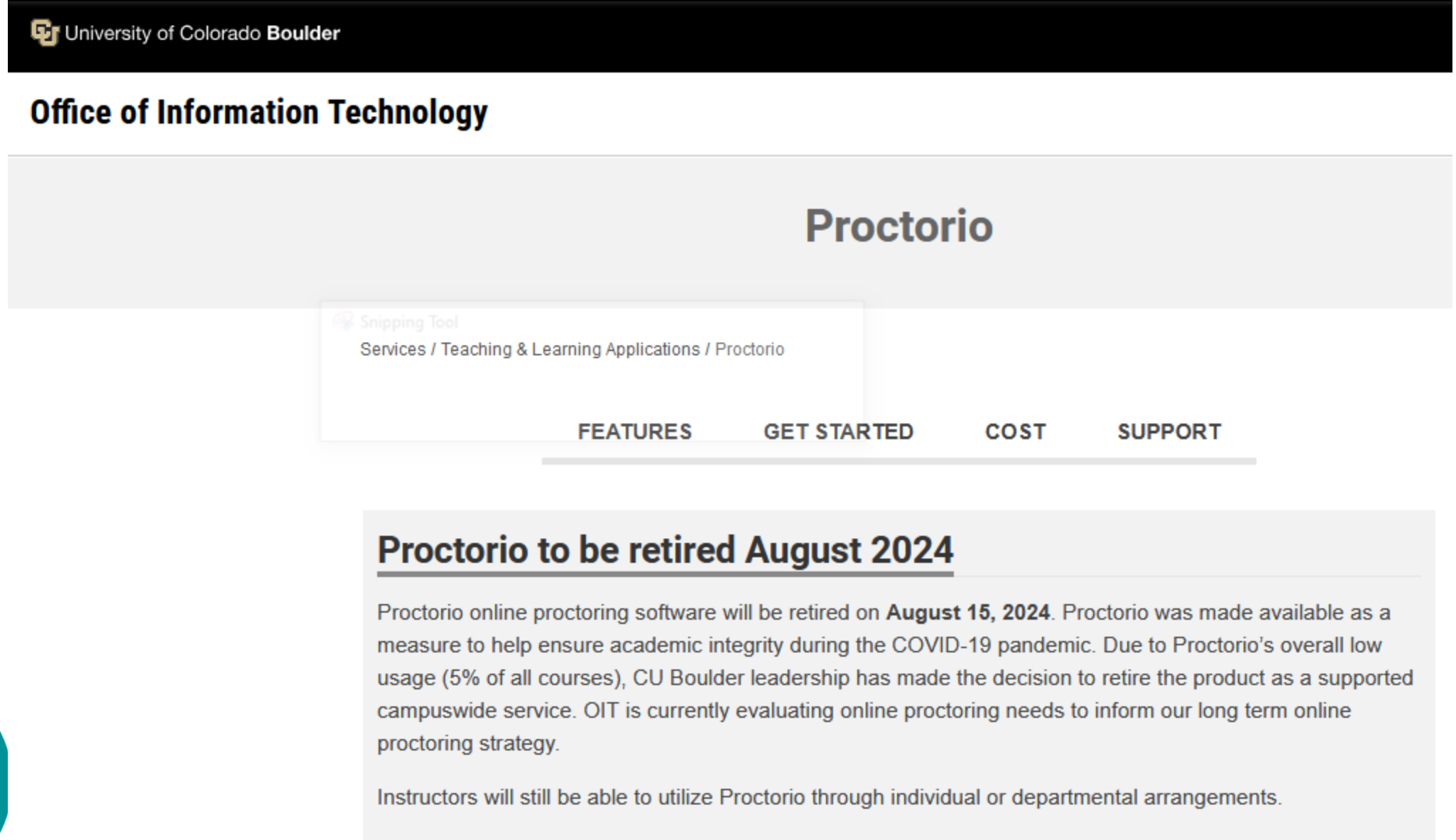
Sign this petition

First name

Last name

Email

Source: https://www.change.org/p/university-of-colorado-boulder-stop-use-of-proctorio-at-cu-boulder-over-privacy-concerns



Source: https://oit.colorado.edu/services/teaching-learning-applications/proctorio (Retrieved July 2024)

Proctorio Spend at UBC

Overall spend:

FY20 (ended March 31, 2020): $40,077
FY21 (ended 2021): $286,140
FY22 (ended 2022): Free

Source:
https://finance.ubc.ca/sites/finserv.ubc.ca/files/FY20%20UBC%20Statement%20of%20Financial%20Information.pdf and
https://finance.ubc.ca/sites/finserv.ubc.ca/files/FY21%20UBC%20Statement%20of%20Financial%20Information.pdf

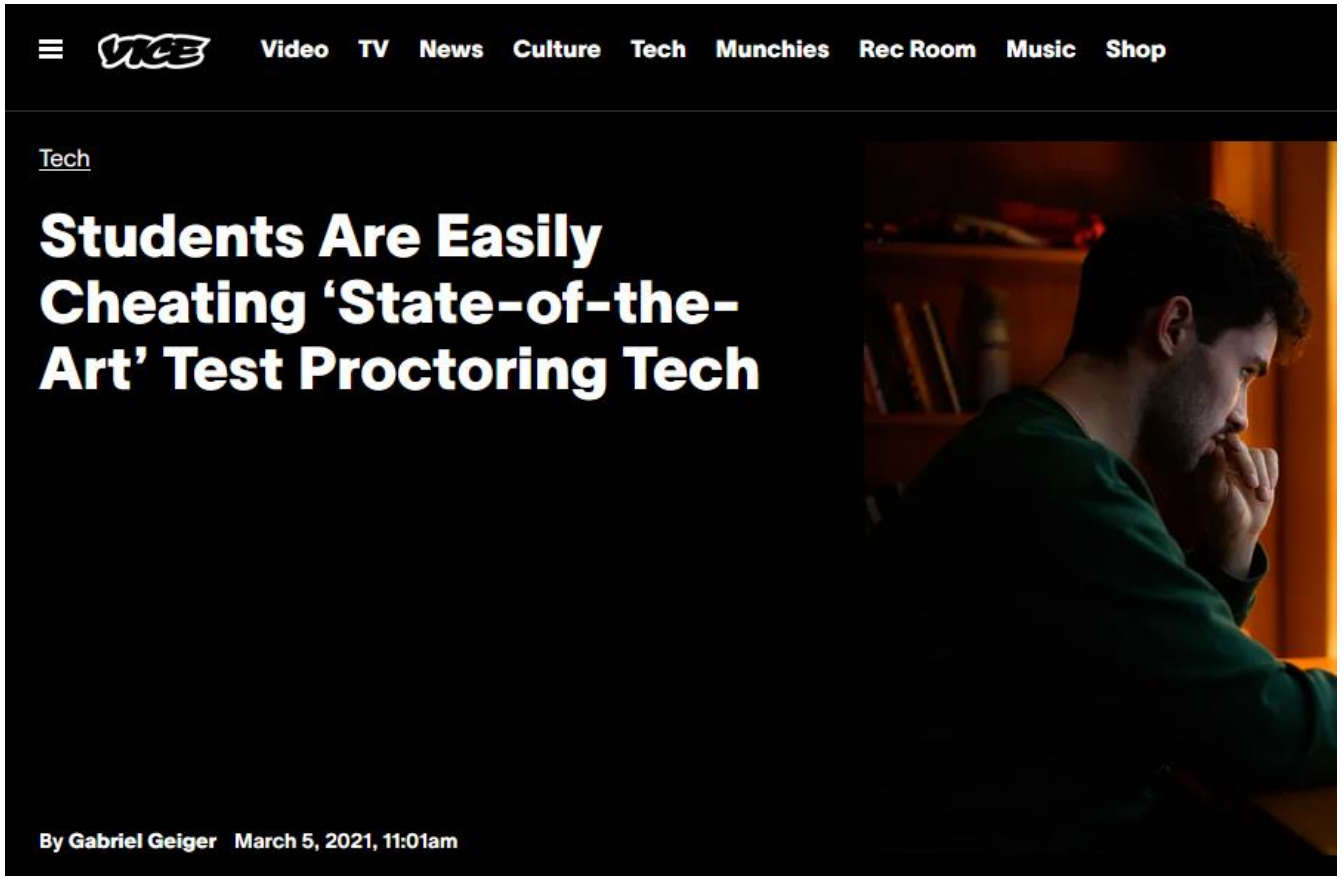
Message to the community regarding Senate vote on use of remote proctoring software

March 18, 2021

Last evening, the UBC Vancouver Senate voted in favour of a motion to direct UBCV Faculties to stop using remote invigilation tools that involve automated recording and algorithmic analysis of data captured during invigilation, except in cases where the use of such 'remote proctoring software' is required by external accreditation bodies. This motion, which is effective immediately, comes after much discussion and consultation with stakeholders across campus, including students and faculty.

Source: https://academic.ubc.ca/academic-community/news-announcements/news/senate-vote-remote-proctoring-software

Does this million dollar software actually stop academic dishonesty?



Source: https://www.vice.com/en/article/students-are-easily-cheating-state-of-the-art-test-proctoring-tech/

Does this million dollar software actually stop academic dishonesty?

On the Efficacy of Online Proctoring using Proctorio

Laura Bergmans, Nacir Bouali, Marloes Luttikhuis and Arend Rensink
University of Twente, Enschede, The Netherlands

- "The experiment involved 30 students, 6 of which were asked to cheat in various ways, while 5 others were asked to behave nervously but make the test honestly...
- The most important findings were that none of the cheating students were flagged by Proctorio, whereas only one (out of 6) was caught out by an independent check by a human agent. The sensitivity of Proctorio, based on this experience, should therefore be put at very close to zero...
- The use of online proctoring is therefore best compared to taking a placebo: it has some positive influence, not because it works but because people believe that it works, or that it might work."

Source:
https://ris.utwente.nl/ws/portalfiles/portal/275927505/3e2a9e5b2fad237a3d35f36fa2c5f44552f2.pdf

Listen to students

Read what they have to say:

- https://www.twitter.com/Procteario
- https://www.twitter.com/ProcterrorU

Read thousands of student reviews:

- https://googlereviews.linkletter.org

Share these voices with people who may not otherwise know what students are experiencing. They contain evidence of harm.

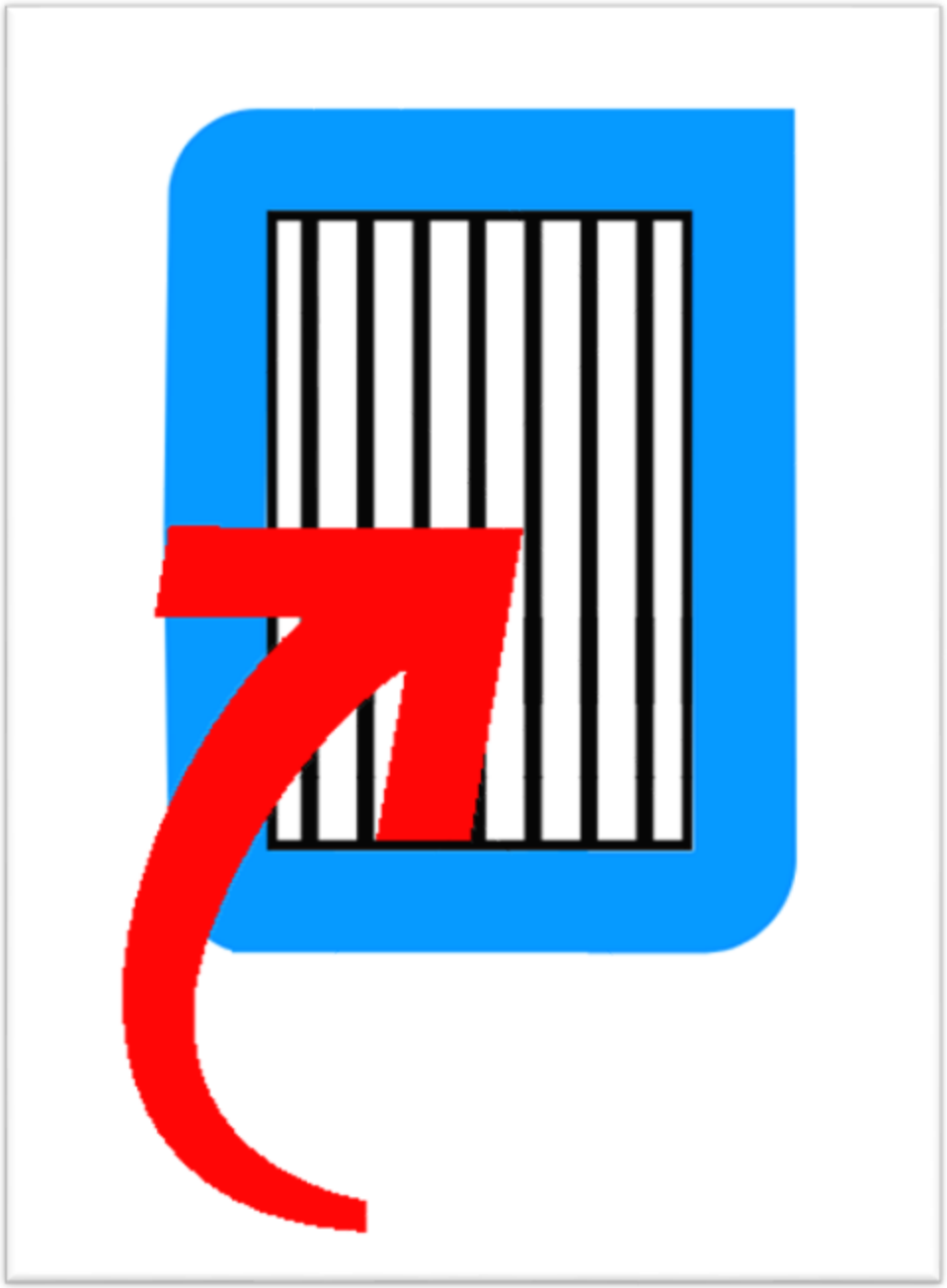
What about lockdown browsers?

Technical issues abound

Compatibility issues with accessibility software and extensions

Use of second devices not prevented

Potential for data breaches



Academic Surveillance Software

Plagiarism Detection

- Assignments are scanned for similarity
- Student work becomes part of the database
- Internet content is also searched for similarity
- Business model in danger because of ChatGPT
- Turnitin added AI to the product without warning
- Over 200 million papers have been scanned since release

How do AI detectors work?

- Use natural language processing to evaluate text perplexity.
- Perplexity means how surprising the word choice is in an essay.
- The more common your words, the lower the perplexity.
- LLMs like ChatGPT 3 and 3.5 generate low perplexity text by default, but you can instruct them not to. Perplexity is increasing with more recent models.

Turnitin's AI detector

- Released in April 2023 (but many opted out)
- The promise was a 1% rate of false positives
- The truth is that false positives are higher in the real world
- Sentence positive rate is actually 4%
- We tested a new ChatGPT-detector for teachers. It flagged an innocent student. - Washington Post testing found it to be 1 in 16

Source: https://www.turnitin.com/blog/ai-writing-detection-update-from-turnitins-chief-product-officer and https://wapo.st/3Tz8zTY

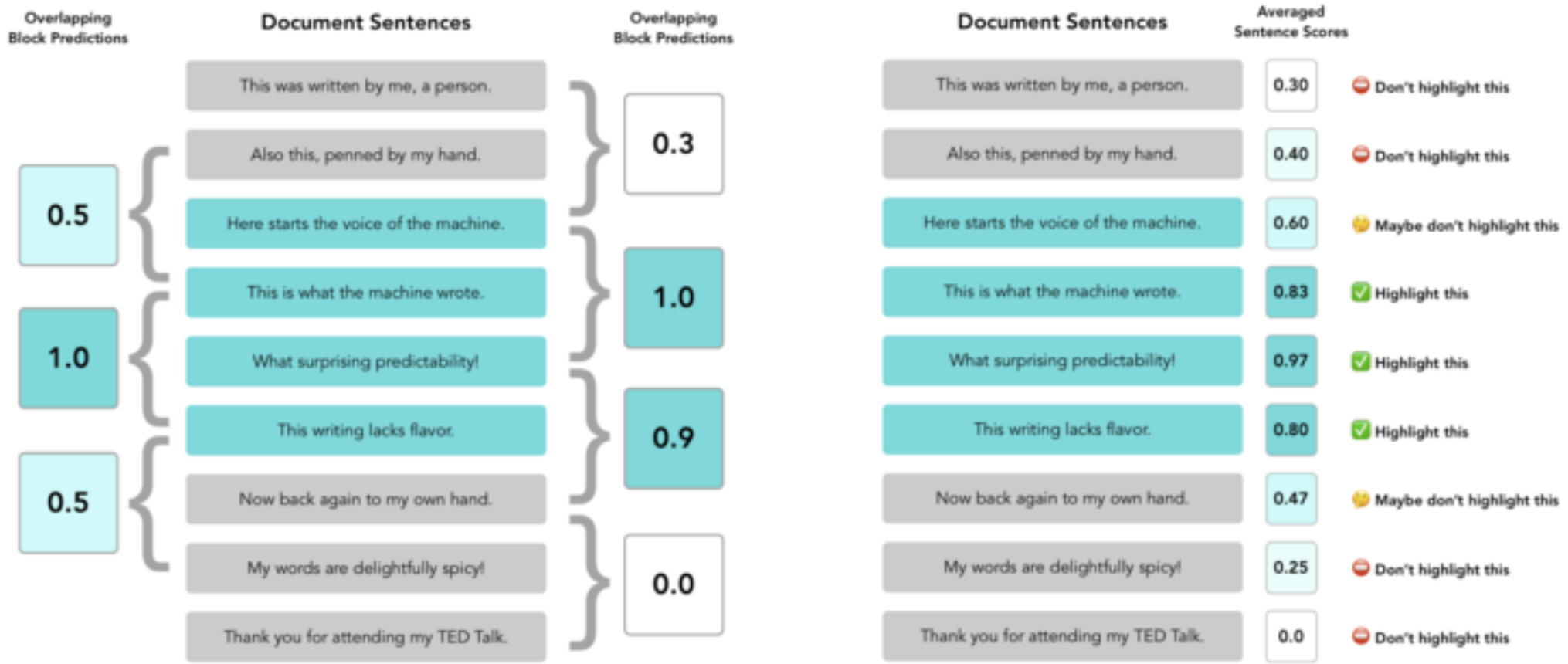
According to Turnitin: how does it work?

"When a paper is submitted to Turnitin, the submission is first broken into segments of text that are roughly a few hundred words (about five to ten sentences). Those segments are then overlapped with each other to capture each sentence in context.

The segments are run against our AI detection model and we give each sentence a score between 0 and 1 to determine whether it is written by a human or by AI. If our model determines that a sentence was not generated by AI, it will receive a score of 0. If it determines the entirety of the sentence was generated by AI it will receive a score of 1.

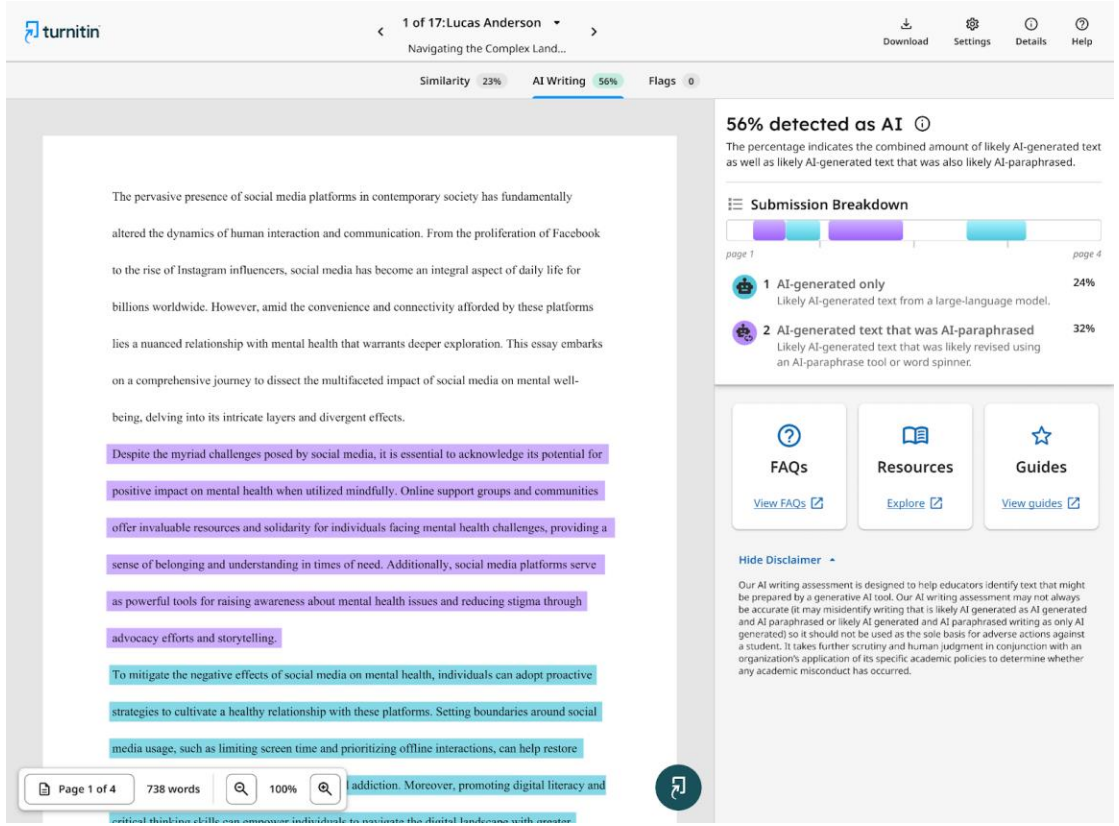
Source: https://guides.turnitin.com/hc/en-us/articles/28477544839821-Turnitin-s-AI-writing-detection-capabilities-FAQs#h_01J2CQS37K893R6BYYQ1QTGCMK

According to Turnitin: how does it work?



Source: https://guides.turnitin.com/hc/en-us/articles/28477544839821-Turnitin-s-AI-writing-detection-capabilities-FAQs#h_01J2CQS37K893R6BYYQ1QTGCMK

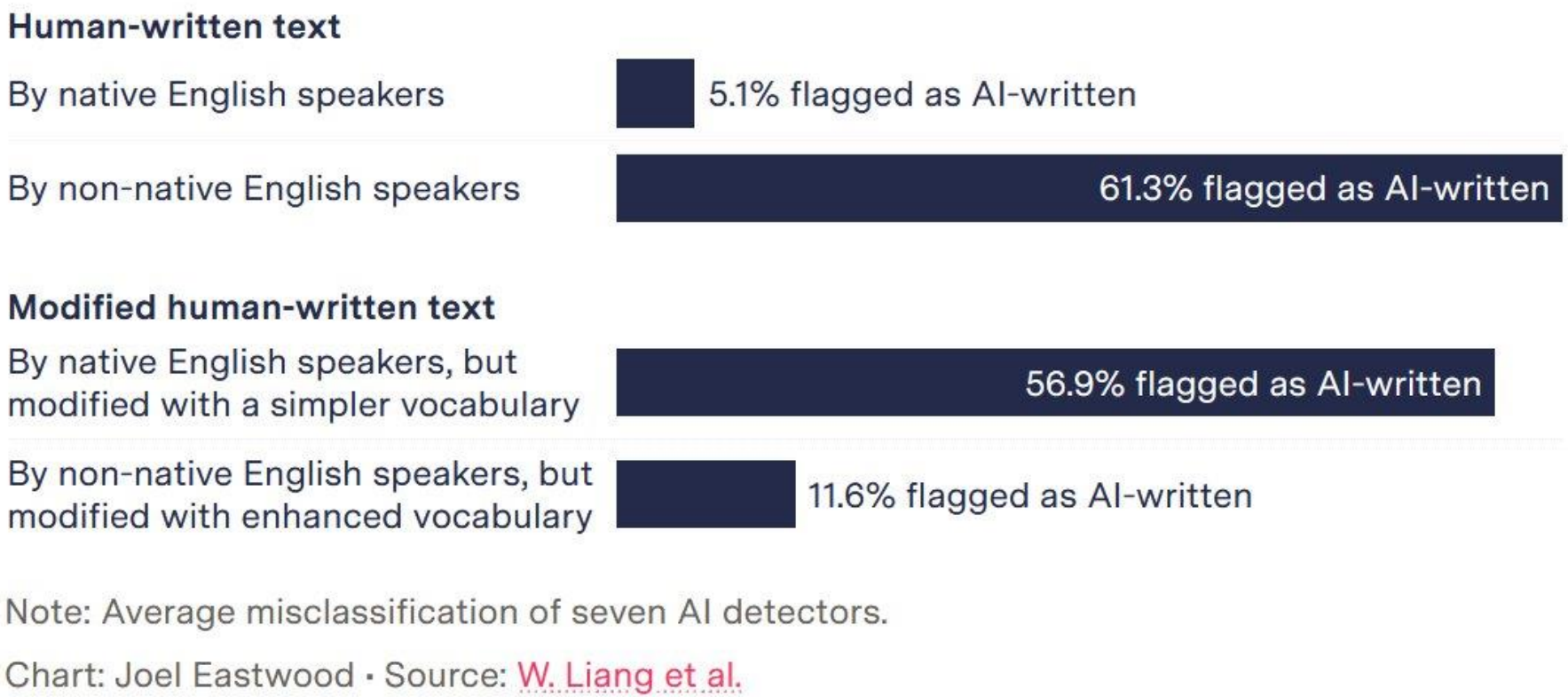
Turnitin demo



https://go.turnitin.com/new-similarity-report

Writing by non-native English speakers more frequently confused with AI

Seven AI detectors frequently misclassified writing by non-native English speakers. Changing the complexity of the vocabulary affected the AI's error rate.



Note: Average misclassification of seven AI detectors.

Chart: Joel Eastwood · Source: W. Liang et al.

Link: https://themarkup.org/machine-learning/2023/08/14/ai-detection-tools-falsely-accuse-international-students-of-cheating

How does Turnitin mitigate bias?

"Our model is trained on a representative sample of data spread over a period of time, that includes both AI generated and authentic academic writing across geographies and subject areas. While creating our sample dataset, we also took into account statistically under-represented groups like second-language learners, English users from non-English speaking countries, students at colleges and universities with diverse enrollments, and less common subject areas such as anthropology, geology, sociology, and others to minimize bias when training our model."

Source: https://guides.turnitin.com/hc/en-us/articles/28477544839821-Turnitin-s-AI-writing-detection-capabilities-FAQs#h_01J2CQS37K893R6BYYQ1QTGCMK

Turnitin on decision-making

"We're not quite sure. We won't say much about the parts where it may be transitioning between human writing and AI writing. It's a fuzzy boundary, **you don't want to do any harm by saying the wrong thing**."

- David Adamson, Turnitin AI Scientist

https://www.youtube.com/watch?t=96&v=g85aB8qaSGc&feature=youtu.be

Students know AI detectors don't work

- "complain to the dean. your professor is using an unreliable tool to avoid fairly grading your work. "
- "Run some of your professor's works through an AI detector :) "
- "make sure you complain in writing, and use terms like "hostile environment" and "creating an unnecessarily adversarial relationship between student and professor" and of course, "I no longer have an expectation of my work being evaluated fairly". "
- "This is the blog post in which OpenAI announced its own detection tool, complete with the update that they shut it down due to low accuracy: https://openai.com/blog/new-ai-classifier-for-indicating-ai-written-text"

Source: https://www.reddit.com/r/ChatGPT/comments/17gj5ky/my_professor_said_turnitin_rated_my_essay_62_ai/

UBC hasn't enabled AI-detection feature

Rationale

- "UBC has not been able to review and validate the feature
- Testing for accuracy in the feature is in early stages
- Instructors cannot double-check the feature results
- Testing for potential bias in the feature is also in early stages
- Results from the feature are not available to students
- Ability of the feature to keep up with rapidly evolving AI is unknown"

Source: https://lthub.ubc.ca/2023/08/28/ubc-affirms-decision-to-not-enable-turnitin-ai-detection/

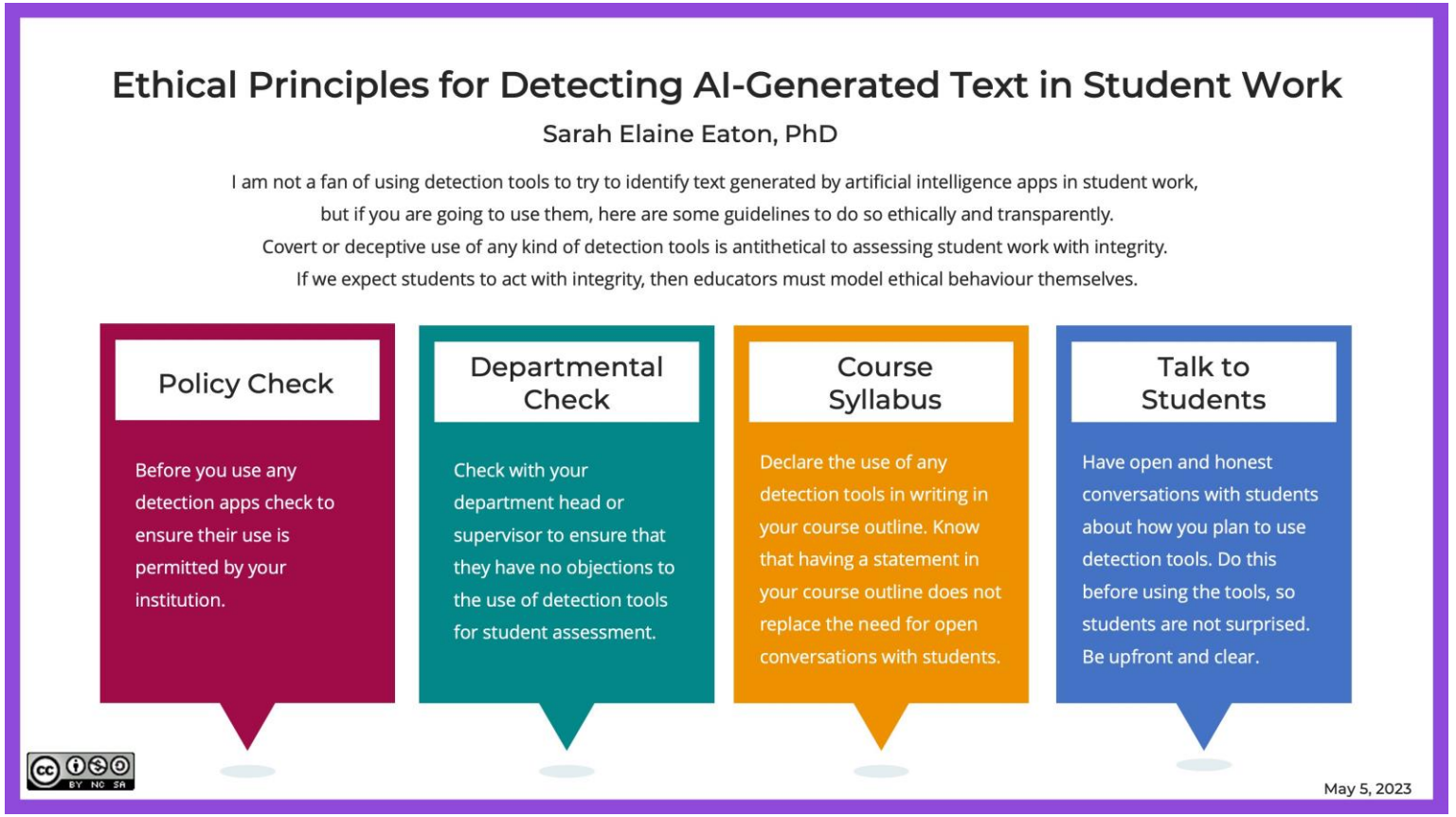
Students can easily circumvent AI detectors... if they have the resources

- Humanizers, word spinners, and rewriters abound
- Students get access to their own AI detector to check and recheck their work until AI is not detected
- Cutting edge models are less likely to be detected
- Students with money and digital literacy have an advantage

AI detectors have no place in education

- Even a 1% rate of false positives is unacceptable
- False negatives exacerbate inequity
- Student assignments are confidential
- Students hold copyright on their work
- In 2023, Turnitin's AI detector was banned at BCIT
- LLM development far exceeds Turnitin development
- Don't buy into the arms race

Still going to use AI detectors? 😔



https://drsaraheaton.com/2023/05/06/the-use-of-ai-detection-tools-in-the-assessment-of-student-work/

Thank you!

This concludes the presentation. Do you have any questions for me? We have some time now.

Please feel free to email me at Ian_Linkletter@bcit.ca or connect with me on LinkedIn, Bluesky, or Mastodon.

Now let's talk about privacy, AI, integrity, and more.