

Your Ultimate Guide to

DATA FORENSICS



LET'S TALK ABOUT INTEGRITY

So you're curious about data forensics (DF)? Good. If you're already thinking about the health of your assessment, especially when it comes to security, then you're on the right track! Give yourself a pat on the back.

But what is data forensics? How does it work? What security threats and vulnerabilities actually apply to your assessment? Consider this your ultimate guide, which will walk you through the basics of statistical analyses and explore security vulnerabilities that may be hidden within your certification program. Keep reading to learn about the hidden costs of poor exam security, what you should do after you conduct data forensics, and (importantly) how to help your organization adopt this program-strengthening practice.

HERE'S TO EXAM INTEGRITY!



STATISTICS, STATISTICS, STATISTICS!

DEMYSTIFYING THE SCIENCE BEHIND DATA FORENSICS

SIMILARITY

Examine how closely an individual's responses match other individuals', and calculate the probability of the matches.

ABERRANCE

Scan for unusual patterns in the data. These statistics are most useful in supporting other statistics.

ANSWER CHANGES

Tabulate how many answers were changed on a test, and flag high rates of wrong-to-right answer changes.

PROGRAM-SPECIFIC INDICATORS

A range of statistics that can be tailored to flag unusual testing behaviors based on a program's specific needs.

SCORE DIFFERENCES

Use information about items to examine differences in performance, which can reveal inconsistent test-taking behavior.

TIMING

Examine unusual response time patterns to monitor for abnormal test-taking behavior, like super-human speed.



THE LANGUAGE OF DATA FORENSICS

What can data forensics monitoring uncover?

STATISTICAL ANOMALIES

Unusual patterns in the data that may or may not reflect violations or fraud.
Example: Examinees demonstrating two different levels of proficiency

TESTING IRREGULARITIES

Out-of-the-ordinary events occurring during testing, not always violations.
Example: A fire alarm disrupts test takers during the testing window

SECURITY VIOLATIONS

Events that violate testing protocol and could potentially threaten test security.
Example: The seats in the testing room are too close together

SECURITY BREACHES

Exam integrity has been jeopardized, though not necessarily on purpose.
Example: Administrator accidentally discloses exam content to examinees

TEST FRAUD

An intentional act that threatens the integrity of an exam.
Example: Administrator intentionally discloses answers to examinees

HOW DOES **DF** WORK?



6 REASONS YOUR CERTIFICATION PROGRAM NEEDS DATA FORENSICS

1

TO MAINTAIN THE VALUE OF YOUR CERTIFICATION

Engaging in data forensics offers proof to your stakeholders, your industry, and the world that you are taking steps to ensure that your certification is an accurate representation of your candidates' skills.

4

TO HIGHLIGHT INSTANCES OF TEST FRAUD

Data forensics can tell you where and when suspect activity occurred, and by whom. It can reveal large-scale, organized fraud and even detect fraud among individuals.

2

TO DETER TEST FRAUD BEFORE IT HAPPENS

By publicizing your use of data forensics, you can deter test fraud. Both candidates and stakeholders will know that test fraud of any kind is neither tolerated nor easy to get away with.

5

TO COLLABORATE WITH TEST SECURITY EXPERTS

Data forensics experts can assess the health of your program, keep you abreast of the latest security innovations, and offer sound advice based on their experience in test security and data forensics.

3

TO REVEAL SECURITY VULNERABILITIES

Data forensics can detect potential security vulnerabilities before a widespread breach, allowing the issue to be addressed as soon as it appears.

6

TO PLAN FOR THE FUTURE OF YOUR PROGRAM

Not only can data forensics help you respond to a security breach before it wreaks havoc on your program, but it also helps you make informed decisions to improve your test security in the future.

TEST SECURITY THREATS LURKING UNDER THE SURFACE

EXAMINEE COLLUSION

Similarity statistics and source-copier statistics can sniff out examinees who peek at others' exams or who share test content with other examinees.

TEST KILLERS

Similarity statistics and flawed-key analyses detect use of stolen exam content contained in "Test Killers" distributed within small cheat rings and dispersed among test takers.

FRAUDULENT TEST SITES

Data forensics can detect test sites operated by pirates and fraudsters, and can provide the necessary evidence for taking legal action.

ADMINISTRATOR COLLUSION

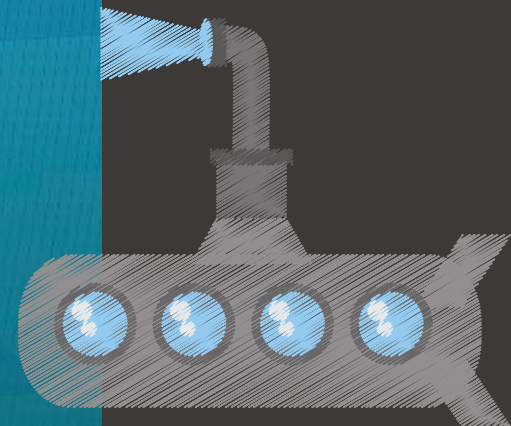
Wrong-to-right answer-change and similarity analyses can help detect educators and exam administrators who commit test fraud.

LARGE-SCALE COLLUSION

Data forensics can detect large-scale examinee collusion and support disciplinary actions by testing programs against individuals in cases of test fraud.

PROXY TESTERS

Data forensics can uncover the illicit activity of proxy test-takers or professionals for hire, who take tests for others, *and* the candidates who employ them.



THE **HIDDEN COSTS** OF POOR EXAM SECURITY



YOU RECEIVED YOUR DATA FORENSICS REPORT...

WHAT NOW?







Your data forensics expert will work with you to determine the following:

Would you like to receive recommendations in your data forensics report?

What actions would your organization be willing to take? On what evidence?



Possible Courses of Action:

-  Investigation of particular test instances
-  Investigation of particular test groups
-  Investigation of particular test sites
-  Refurbishment of tests when pass rates creep up
-  Score invalidation of specific test instances
-  In extreme cases, legal action against test fraud

5 WAYS TO CONVINCING YOUR ORGANIZATION TO ADOPT DATA FORENSICS

"I want this certification to mean something to the people who worked hard to earn it."

"Let's protect this team's investment— We've worked hard on this."

"We already have the necessary data to conduct Data Forensics."

"We could save time and resources in the long run if we conduct Data Forensics now."

"Data Forensics will be an efficient way to pinpoint any of our security vulnerabilities."

LEARN WITH US

This learning resource was created by Caveon.

At Caveon, we recognize that validity, reliability, and fairness can only be achieved when exams are secure. Quality exams that are secure benefit assessment programs, test takers, and society alike.

That's why, for more than 15 years, Caveon has driven the discussion and practice of exam security in the testing industry.

Today, as the recognized leader in the field, Caveon's offerings have expanded to encompass innovative solutions and technologies that provide comprehensive protection: Solutions designed to detect, deter, and even prevent test fraud. We are committed to integrity in testing. Period.



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