SECURING ONLINE ASSESSMENTS WITH BIOMETRIC SIGNATURE-ID (BSI)

Presenter: David Chatham, Dean of Academic Technology, CCCOnline

Session Explores the Technology of Cheating, and Student Verification, and Detection
Securing Online Assessments

- The State of Assessment Security?
- Establishing Trust with Our Partner Colleges
- Review of Available Technology for Test Security
- Biometric Signature ID Project and Roll-out
- Suspicious Activity Reporting
How bad is the problem of Assessment security?

A. Non-issue  
B. Small problem  
C. Modest issue  
D. Significant problem

What do you think?
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All you have to do is let us know what the exam is about and we will find the right expert you can hire to take your exam.
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Security Features

- State seal in 2-tone optical variable ink
- State seal visible on front under UV light
- "REAL ID" Gold Star in top right corner if issued after July 1, 2013

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High Tech Cheating on Proctored Exams

• 40 Students use Technology in Exam Cheating Ring

In Fuzhou, Guangzhou province, police found this wallet receiver contraption on the person of a male test taker. The contraption works in conjunction with a small camera. The receiver was tied to the young man’s armpit. The camera was built into a plastic drink bottle.
Technology for Classroom Cheating

If your chances to pass the exam are zero to none, there are solutions that can help you....

LOOK HOW IT WORKS!
AND START COMMUNICATING IN SECRET WITH YOUR PARTNER
Cheating Demo

https://www.youtube.com/watch?feature=player_detailpage&v=JnchSQ_gNXI
Background of Current Testing Security – who cheats?

Baird (1980) found 75.5% undergraduates in several majors
Meade (1992) reported 87% in various majors at top universities
McCabe (2005) counted 70% of 50K undergraduates from ‘02-’05
Park (2003) Minimum of 50% of students are cheating
Background of Current Testing Security - *happens on-campus and online*

Marshall University Study Academic Dishonesty Assessment

- Classroom $\frac{1}{3}$rd and Online $\frac{1}{3}$rd Cheated at some time...

*Cheating in the Digital Age: Do Students Cheat More in Online Courses?* George Watson and James Sottile, Marshall University - *Online Journal of Distance Learning Administration, Volume XIII, Number I, Spring 2010, University of West Georgia, Distance Education Center*
Establishing Trust with Our Partner Colleges – possible solutions available

- **Solution #1**: F2F Proctored testing on campus
  - Logistics issues for testing around the state
  - Travel problems for students

- **Solution #2**: Online testing best practices
  - Timed tests to defeat open book or Google answers
  - Random question generator to mitigate passing answers around
  - More essay, short answer tests – harder to handle without knowing the subject
  - Authentic testing involving problem solving and applied learning

- **Solution #3**: Technological documentation / authentication
Establishing Trust with Our Partner Colleges

• **Solution#2:** **Online assessment, best practices**
  • Provides a better course, better measurement, better security in the long run but takes more time and resources to develop
  • Resources: solid course statistics, instructional design, and assessment strategies pertinent to subject area

• **Solution#3:** **Technological documentation / authentication**
  • Lab Reports – Originality Checking, TII ✔
  • Science kit labs -- Student photographs stages of their experiments ✔
  • Identity Authentication or Remote Proctoring
Review of Available Technology for Assessment Security - Attributes

Important attributes of a solution

1. Assure the student’s identity
2. No extra cost to student
3. Predictable cost for us
4. No extra technology for student
5. Runs on the students current network
6. Runs on pc, phone, tablet, etc.
7. Available 24/7
8. Available without appointment
9. No added responsibility to instructors or follow-up
# Review of Available Technology for Test Security - Comparing Solutions

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Live Video Proctor</th>
<th>Passive Video Proctor</th>
<th>Biometrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assure student’s identity</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>No extra cost to student</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Predictable cost to CCCO</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>No extra technology</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Runs on all networks</td>
<td>N</td>
<td>Y*</td>
<td>Y</td>
</tr>
<tr>
<td>Works on pc, mobile devices</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Available 24 / 7</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Available w/o appointment</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>No instructor responsibility</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
</tr>
</tbody>
</table>

* Y indicates available, N indicates not available.
BSI Gate to Assessments

1. Student Clicks D2L Quiz /BSI Link

2. Student Taken to BSI Gate

3. Uses PIN, BSI puts value in D2L Grade book=1

4. D2L Quiz Link Appears & Ready to Use

Bio-Sig Demo
BSI LTI Integration with CCCOnline courses

- **Pilots in two courses SP 14**
  - No major issues for students or instructors
  - Replication LTI issue during course copy resolved before FA 14

- **Full Production FA 14**
  - Nine Science Courses:
    - BIO111, 201, 202
    - CHE111
    - PHY111, 112, 211, 212, 213
  - One Math Course: MAT 121 – *Tech issue with Microsoft upgrade*
  - Licensed 3,000 students for FY 15 – *very few helpdesk requests*
New - Real Time Event Notification

This is an automated e-mail triggered by the following user:

Account: Colorado Community College System MLP
LMS: Desire2Learn

Risk assessment:

RTEN: Too many login failures in a given time.

You are receiving this email because your address is configured to receive automated messages.
If you have questions/problems contact your service provider directly.
BioSig-ID™ protects your virtual Identity!

powered by

Biometric Signature ID
708 Valley Ridge Circle Suite 8
Louisville, TX 75057-3318
RTEN Review Process

#1 Pull a Custom Report on the students test login history for 60 days
   • Look for pattern of login failures, clues:
     • IP Address timing issues
     • Changing IP address
     • Test time coincidence with login failure?
     • Or reach out to student to assist with login issues

#2 Send to Student Services for Review and Action
   • Warning letter
   • Further action if needed
## Example Custom Report

### Custom Detail Report

**From:** 2/8/2015  
**To:** 4/9/2015

<table>
<thead>
<tr>
<th>Time</th>
<th>Signature Data</th>
<th>Client IP</th>
<th>Device</th>
<th>Context Action</th>
<th>Succ</th>
<th>Acc.</th>
<th>App</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/9/2015 9:20:16 AM</td>
<td>3085</td>
<td>63.150.186.26</td>
<td>Mouse</td>
<td>Validate/Validate Profile</td>
<td>✔</td>
<td>66</td>
<td>Biosig-ID</td>
</tr>
<tr>
<td>2/9/2015 8:56:39 PM</td>
<td>3085</td>
<td>None</td>
<td>Mouse</td>
<td>Validate/Validate Profile</td>
<td>✔</td>
<td>82</td>
<td>Click-ID</td>
</tr>
<tr>
<td>2/9/2015 9:56:39 PM</td>
<td>3085</td>
<td>102.194.133.190 Fortuna, CA, US (AT&amp;T U-verse)</td>
<td>Mouse</td>
<td>Enroll/lock Profile</td>
<td>✔</td>
<td>0</td>
<td>Biosig-ID</td>
</tr>
<tr>
<td>2/9/2015 8:58:40 PM</td>
<td>3085</td>
<td>162.194.133.106 Fortuna, CA, US (AT&amp;T U-verse)</td>
<td>Mouse</td>
<td>Enroll/Create Profile</td>
<td>✔</td>
<td>100</td>
<td>Biosig-ID</td>
</tr>
<tr>
<td>2/9/2015 8:39:43 PM</td>
<td>3085</td>
<td>102.194.133.190 Fortuna, CA, US (AT&amp;T U-verse)</td>
<td>Mouse</td>
<td>Enroll/Create Profile</td>
<td>✗</td>
<td>0</td>
<td>Biosig-ID</td>
</tr>
<tr>
<td>2/9/2015 9:00:19 PM</td>
<td>3085</td>
<td>162.194.133.190 Fortuna, CA, US (AT&amp;T U-verse)</td>
<td>Mouse</td>
<td>Enroll/Create Profile</td>
<td>✗</td>
<td>0</td>
<td>Biosig-ID</td>
</tr>
</tbody>
</table>
Other Tools Used: MaxMind IP Look-Up

**GeoIP2 Precision Lookup Form**

### GeoIP2 Precision: Insights Results

<table>
<thead>
<tr>
<th>IP Address</th>
<th>Country Code</th>
<th>Location</th>
<th>Postal Code</th>
<th>Coordinates</th>
<th>ISP</th>
<th>Organization</th>
<th>Domain</th>
<th>Metro Code</th>
<th>User Type</th>
<th>Confidences</th>
</tr>
</thead>
<tbody>
<tr>
<td>216.185.39.166</td>
<td>US</td>
<td>Columbus, Ohio, United States, North America</td>
<td>43215</td>
<td>39.9612, -82.9988</td>
<td>Alentus Corporation</td>
<td>Int7 (Switzerland) Ltd.</td>
<td></td>
<td>535</td>
<td>cellular</td>
<td>city: 11, subdivisions: 11, country: 63, postal: 10</td>
</tr>
<tr>
<td>182.66.47.17</td>
<td>IN</td>
<td>India, Asia</td>
<td>20, 77</td>
<td></td>
<td>Bharti Broadband</td>
<td>Bharti Airtel</td>
<td></td>
<td></td>
<td></td>
<td>country: 98</td>
</tr>
<tr>
<td>66.171.229.141</td>
<td>US</td>
<td>Torrance, California, United States, North America</td>
<td>90503</td>
<td>33.8359, -118.3406</td>
<td>nLayer Communications</td>
<td>nLayer Communications</td>
<td></td>
<td>803</td>
<td>hosting</td>
<td>city: 27, subdivisions: 37, country: 74, postal: 27</td>
</tr>
</tbody>
</table>

### Service

**Insights (9631 lookups available)**

### IP Addresses

Please enter one IPv4 or IPv6 address per line.

216.185.39.166
182.66.47.17
66.171.229.141
Other Tools:

- IP Tracking Tool (D2L)
- MaxMind (Commercial IP Database)
### Other Tools:

<table>
<thead>
<tr>
<th>TIME</th>
<th>EVENT</th>
<th>IP ADDRESS</th>
<th>CITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:43 AM</td>
<td>Quiz Entry</td>
<td>216.185.58.180</td>
<td>Columbus, OH</td>
</tr>
<tr>
<td>10:43 AM</td>
<td>Response to Question 1 Saved.</td>
<td>216.185.58.180</td>
<td>Columbus, OH</td>
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<td>10:47 AM</td>
<td>Response to Question 2 Saved.</td>
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<td>10:47 AM</td>
<td>Response to Question 3 Saved.</td>
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<td>10:48 AM</td>
<td>Response to Question 4 Saved.</td>
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<td>Columbus, OH</td>
</tr>
<tr>
<td>10:57 AM</td>
<td>Response to Question 5 Saved.</td>
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<td>Columbus, OH</td>
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<tr>
<td>11:03 AM</td>
<td>Quiz Re-entry</td>
<td>204.93.58.165</td>
<td>San Jose,</td>
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<tr>
<td>11:04 AM</td>
<td>Response to Question 7 Saved.</td>
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<td>11:05 AM</td>
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<td>11:05 AM</td>
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<td>Response to Question 15 Saved.</td>
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<td>San Jose,</td>
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<td>11:22 AM</td>
<td>Quiz Re-entry</td>
<td>204.93.58.222</td>
<td>San Jose,</td>
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<tr>
<td>11:22 AM</td>
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<td>San Jose,</td>
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<td>11:23 AM</td>
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<td>San Jose,</td>
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<td>11:28 AM</td>
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<td>11:29 AM</td>
<td>Response to Question 18 Saved.</td>
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<td>San Jose,</td>
</tr>
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<td>11:35 AM</td>
<td>Quiz Re-entry</td>
<td>204.93.58.222</td>
<td>San Jose,</td>
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<td>11:43 AM</td>
<td>Quiz Re-entry</td>
<td>204.93.58.222</td>
<td>San Jose,</td>
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<td>11:47 AM</td>
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<td>Torrance,</td>
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<td>Torrance,</td>
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<td>12:01 PM</td>
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<td>Torrance,</td>
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<td>12:01 PM</td>
<td>Quiz Submission Confirmation Screen</td>
<td>50.118.162.110</td>
<td>Torrance,</td>
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<tr>
<td>12:01 PM</td>
<td>Quiz Completion</td>
<td>172.22.3.20</td>
<td></td>
</tr>
</tbody>
</table>
Results: BSI Tools and D2L/MaxMind Tools

SP15 – CURRENT COUNT

• 10 BSI Courses: **warnings sent to 20 students**
• Other Non-BSI SCI, ACC, CSC and MAT courses: **30 warnings sent**
• Review and Reconfigure BSI Course List for FY 16
Not the End... What is the Future?

- Biometric Signature-ID RTEN will refining students PIN responses and IP addresses
  - Foreign or Out-of-State IP addresses
  - High grades
  - Single Course Enrollment
  - First Time Enrollment

- Data Forensics.....electronic trail of student’s activities around assessments
  - Caveon (http://www.caveon.com/)– using data analysis to find anomalies after the test is taken and who was likely cheating
  - College Boards
  - Mississippi State Department of Education

- Statistical Methods
  - Used by IRS to detect tax cheaters
  - Used by businesses use to detect accounting fraud