



I Get It! I Know Security is Important, but Now What?"

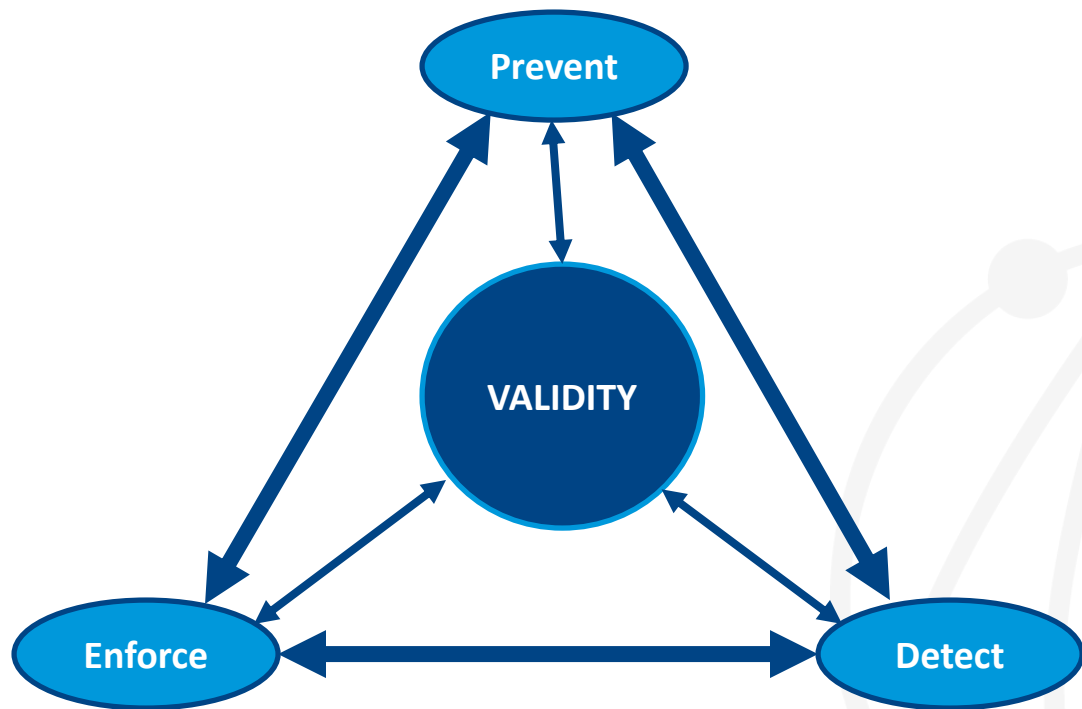
Webinar – July 1, 2015



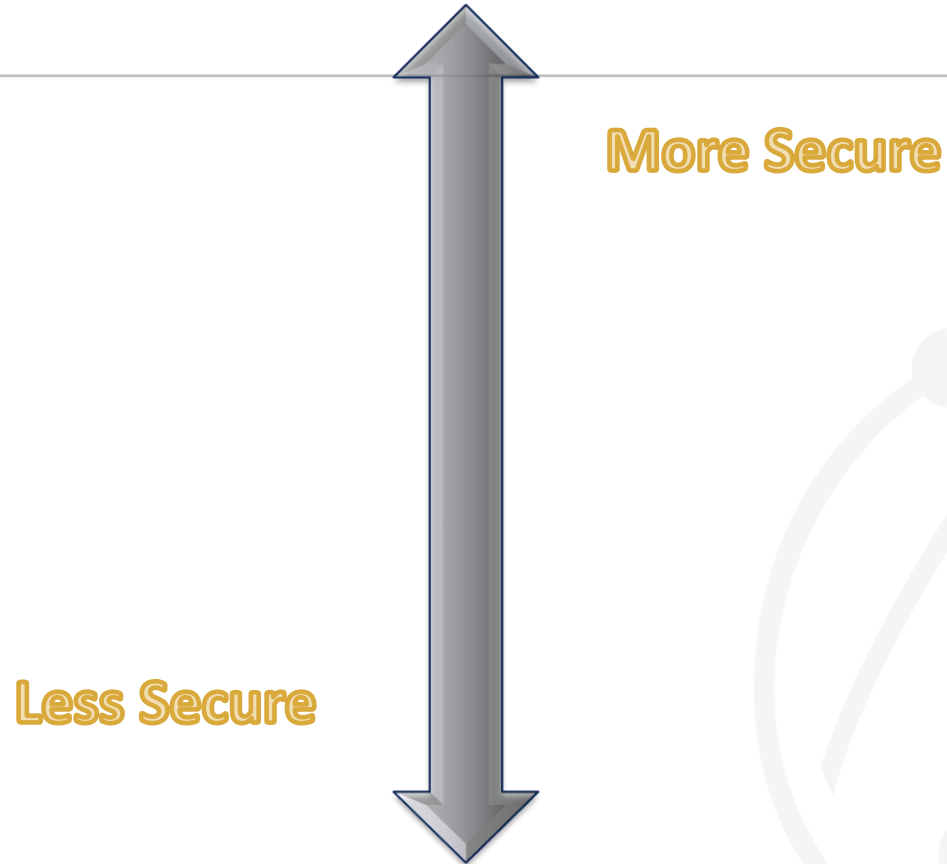
Director and Senior Security Consultant

JILL BURROUGHS

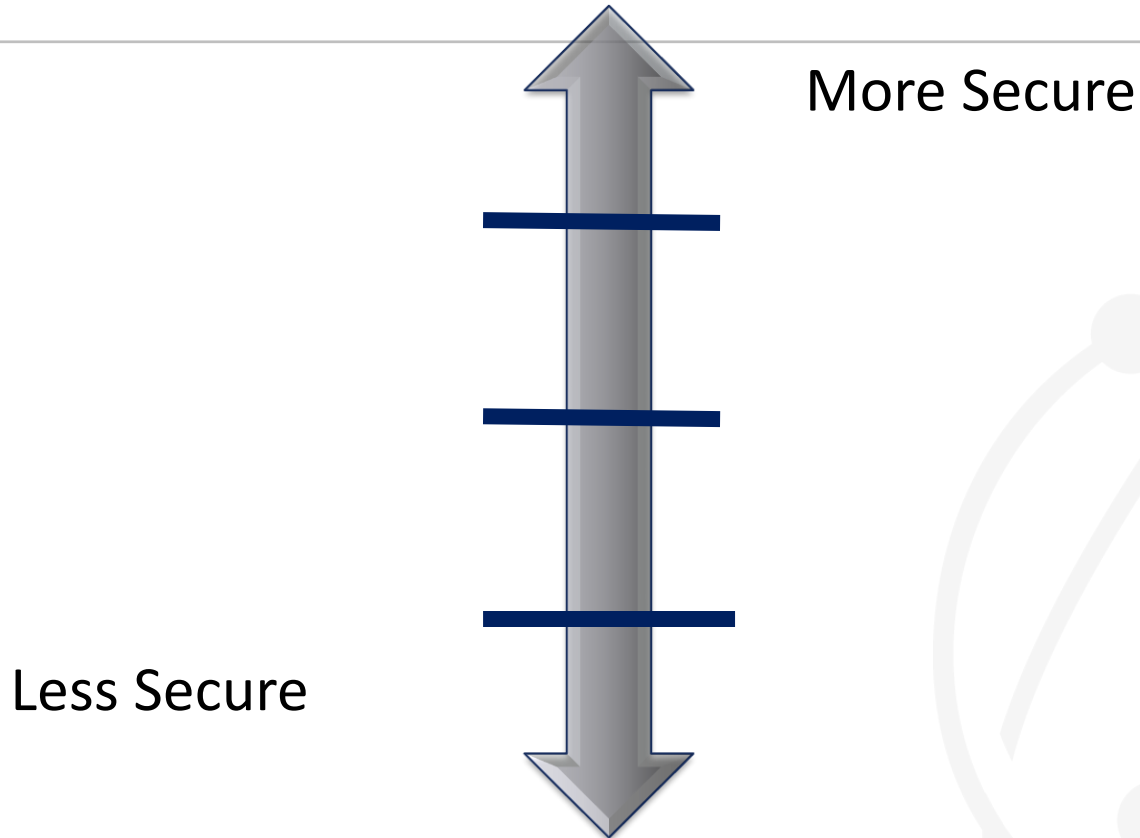
Security Validity Triangle



Security Continuum



Security Continuum



Best Practices in Prevention



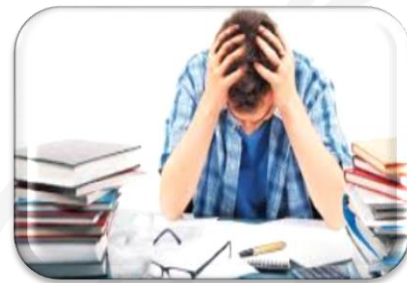
Security Practices-Prevention



Education

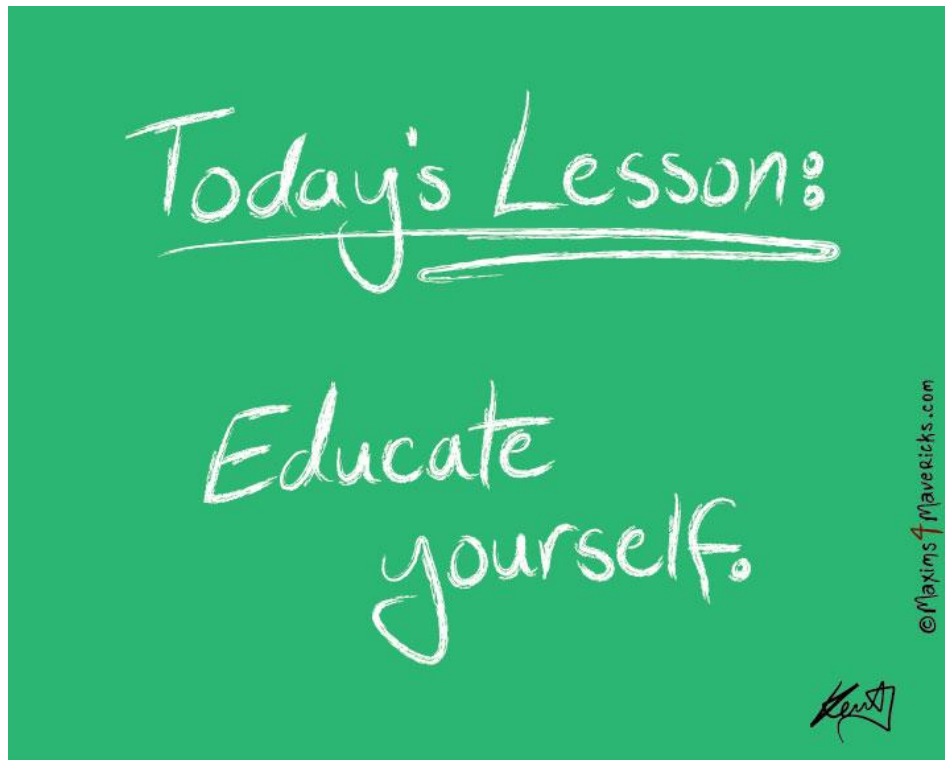


Policies and Procedures



Holistic Test Design

Today's Lesson



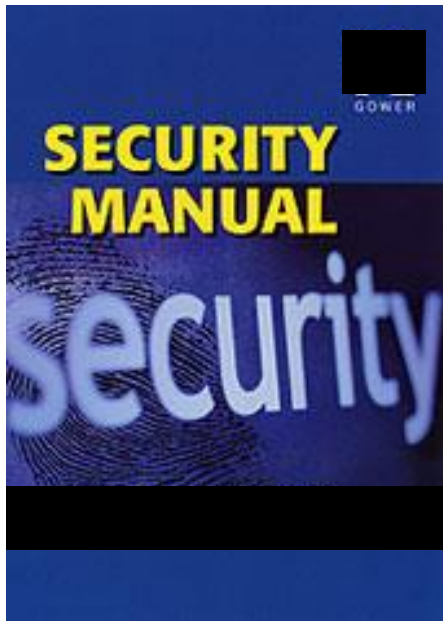
Educate Yourself



Policies and Procedures



Internal Policy and Procedure



Internal Policy and Procedure



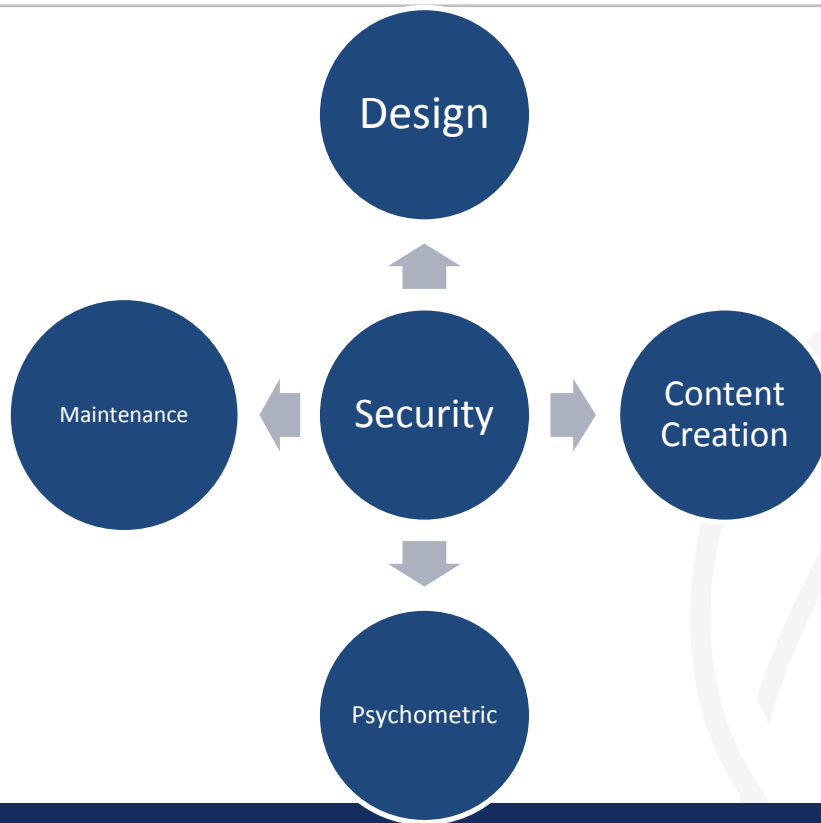
Internal Policy and Procedure



Internal Policy and Procedure



Holistic Test Design



Prevention on a Budget



Prevention on a Budget





Technology Solutions

SHANE FREEMAN

Technology for Detection & Automation

- » What can technology do to enhance the security of my exam and program?
- Detect Exposed Content
 - Detect Policy Violations
 - Detect Unintended Advantage
 - Automate Enforcement



Crawling the Web for Exposed Content

» Methods of detection

- *Very Predictive*
- A 3rd party service
- Setup your own Google Alerts

» Methods of resolution

- *Very Expensive*
- Time
- Money

» Your first red flag!



ACSM	IFPUG	CIW	Palo Alto Networks
Adobe	IIA	Cloudera	Pegasystems
AIIIM	IIBA	CompTIA	PEOPLECERT
Alcatel-Lucent	Informatica	CWNIP	Polycom
Alfresco	IQN	ECCouncil	RedHat
Amazon	Isaca	EMC	Riverbed
AndroidATC	ISC	Enterasys	RSA
APICS	ISQI	Ericsson	Salesforce
Apple	Juniper	Esri	SAS Institute
Aruba	Liferay	Exin	SNIA
Avaya	LPI	Extreme Networks	SOA
Axis Communications	Magenta	F5	Software
BACB	McAfee	FileMaker	Certifications
BCS	Microsoft	Fortinet	SolarWinds
BICSI	Mile2	GAQM	Specialized
BlackBerry	Motorola Solutions	Genesys	Certifications
Blue Coat	Network Appliance	GIAC	SpringSource
Brocade	NI	Google	Symantec
CA Technologies	Nokia	Guidance Software	The Open Group
Checkpoint	Novell	Hitachi	Tibco
Cisco	OMG	HP	VCE
Citrix	Oracle	HRCI	Veeam
		Huawei	VMware
		IBM	Zend

Detecting Security Issues

» Pre-Import Detection Using Security Scripts

- Test for data anomalies in individual exams
- *Invalidate an exam before the credential is granted*

» Post-Import Detection Using Reporting & Analysis

- Analysis performed by a psychometrician
- *Invalidate an exam after the credential is granted*

Pre-Import Detection (Policy Violations)

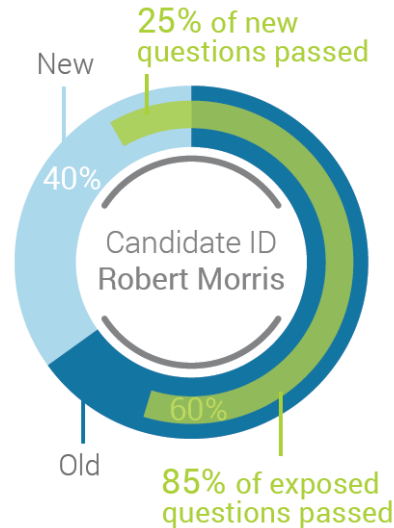
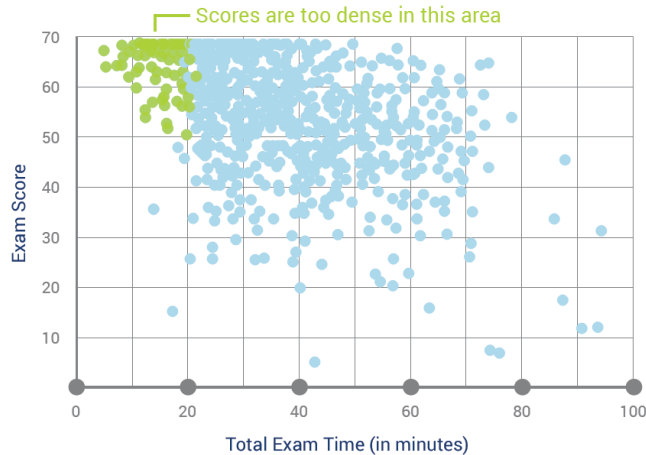
» Comparing current exam to the past exams already imported into the system

- Retake Policies
- Pass then Retake
- Eligibility
- Custom Policies



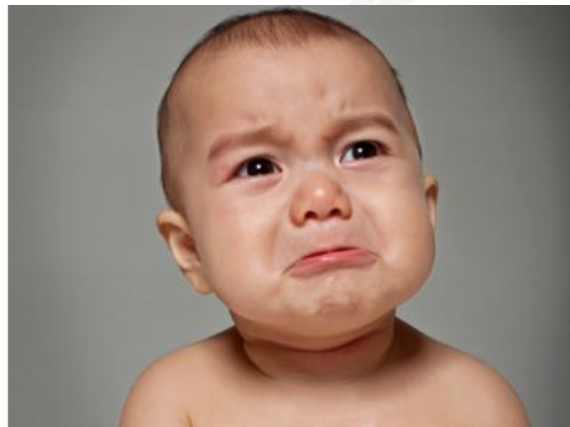
Pre-Import Detection (Unintended Advantage)

- » Through automated security scripts results can be examined individually and reacted to *automatically* in the *same manner*—every time.



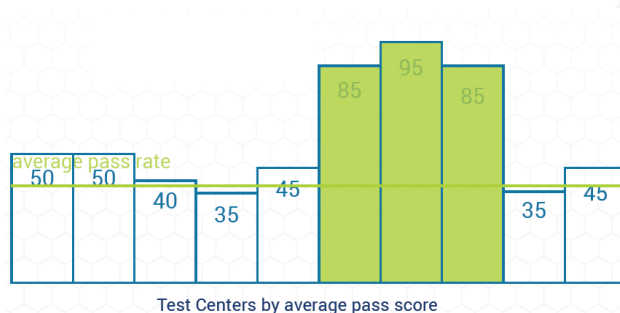
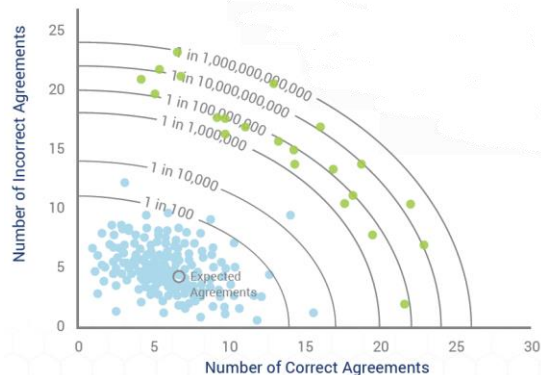
What are my options?

- » Flag for reporting purposes (post import analysis)
- » Flag and send warning email
- » Flag and send for review
 - Invalidated
 - Place on the ban and/or watch list
 - Approve
- » Flag and automatically invalidate
 - e.g. Policy Violations



Post-Import Detection

- » Already imported the exam and given a pass/fail decision
- » Taking data from multiple exams (or the entire program), compiling it and exporting for further psychometric analysis and review.





Psychometrician

JILL VAN DEN HEUVEL



Why Run Custom Reports?

- » Help establish the flagging criteria
 - So the flags meet their needs and purpose
 - Systematic
 - Everyone (candidates/test centers) are treated the same
- » Flags are triggers, not proof
 - Sometimes there are valid and appropriate reasons for “unusual” behaviors
- » Drill down into the data of interest to gather more information
- » Go beyond the flags

Now what?

- » Script shows a test center with a lot of flagged candidate records ...
- » Ad hoc analyses
 - Z-score/Z-time report
 - Compares records based upon any demographic characteristic where minimum size requirement is met (typically $N \geq 20$)
 - Test center
 - “Red Zones”
 - Advantages
 - Uses ALL of the data at a programmatic level
 - Standardized data so comparisons can be across all exam titles
 - Systematic (everyone is treated equally)
 - More “power” with averages across multiple exams/titles

What Will I Get?

- » Brief summary written by a psychometrician
- » Number of flags by demographic group
- » Breakout of demographic groups with combination flags such as high average z-score with low average z-time
- » Reports breaking down each:
 - Demographic group
 - Exam title
 - Candidate record

Show Me ... Flag Counts

Reason for flag	Number of Flagged Test Centers
Low avg. z-score	129
Low avg. z-time	52
High avg. z-time	85
High avg. z-score	66
High avg. z-score Low avg. z-time	8
High avg. z-score High avg. z-time	12
Low avg. z-score High avg. z-time	25
Low avg. z-score Low avg. z-time	17

Test Centers Flagged with High average z-score and Low average z-time

exam_test_center_id	Number of Administrations	Average z-score	Average z-time	z-score flag	z-time flag	Prior Flags
4318092	272	1.074	-0.699	High avg. z-score	Low avg. z-time	
4602988	159	0.697	-0.982	High avg. z-score	Low avg. z-time	
3406854	90	0.565	-0.948	High avg. z-score	Low avg. z-time	
1914203	72	0.948	-1.269	High avg. z-score	Low avg. z-time	
4607694	50	1.388	-1.067	High avg. z-score	Low avg. z-time	
4947356	45	1.311	-1.281	High avg. z-score	Low avg. z-time	
321330	41	1.204	-0.990	High avg. z-score	Low avg. z-time	
46398	22	0.532	-0.735	High avg. z-score	Low avg. z-time	

Show Me ... Breakdown by Test Center

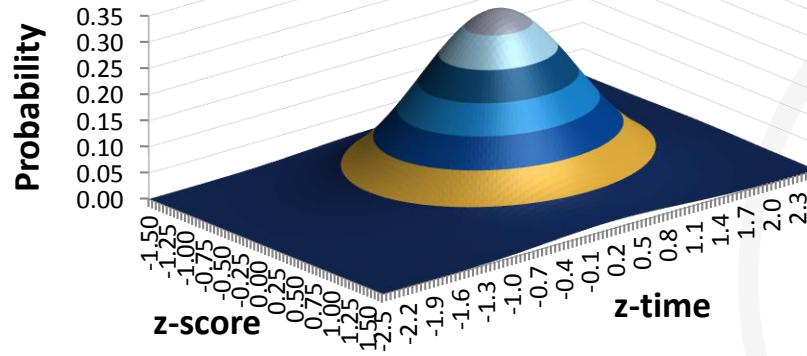
Test Center Id	Number of Administrations	Average z-score	Average z-time	z-score flag	z-time flag
4784760	272	0.026	-0.056		
4318092	272	1.074	-0.699	High avg. z-score	Low avg. z-time
1572448	270	-0.263	-0.147		
641730	252	-2.574	1.645	Low avg. z-score	High avg. z-time
4925495	252	0.028	-0.383		
2660392	223	-0.792	0.184	Low avg. z-score	
3331952	195	-0.229	-0.235		
3555020	171	0.174	-0.596		Low avg. z-time
1340393	161	-0.116	0.151		
2739382	159	0.895	-0.350	High avg. z-score	
6005944	156	0.067	-0.042		
1524312	156	-0.565	-0.550	Low avg. z-score	Low avg. z-time
2583711	90	-0.030	0.140		
900523690	90	0.745	0.951	High avg. z-score	High avg. z-time
1657032	90	-0.426	-0.253		

Show Me ... Breakdown by Exam Number

Exam Number	Count	Average Score	s.d. score	Average Time	s.d. time
21168	20297	739.49	97.43	4604.77	1083.23
13680	18533	691.35	117.02	4235.03	1403.50
18145	15414	703.88	109.17	4527.16	1167.56
8448	9734	678.70	121.82	3931.31	1251.19
11033	9344	724.83	113.08	4829.63	1304.11
13703	7592	688.73	113.09	4331.71	1668.34
10904	4266	765.91	89.47	4476.59	1668.89
2296	3200	70.50	17.89	1818.03	1108.12
5848	3020	772.21	56.58	3890.21	1197.86
3689	2448	728.49	108.72	4170.80	1147.40
7480	1959	593.65	138.65	2657.46	1301.16
15264	1528	735.66	103.10	4051.79	1326.00
6156	1452	618.84	112.07	2544.90	1257.51
4500	1247	41.06	9.48	5682.36	2349.96

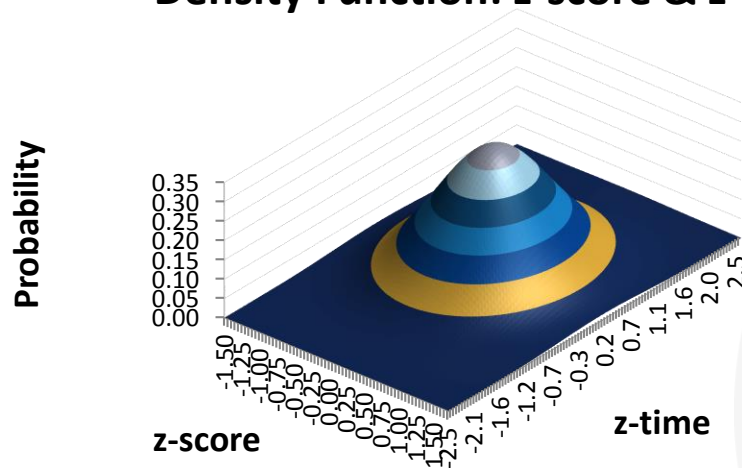
Graphing

Bivariate Standard Normal Distribution Density Function: z-score & z-time



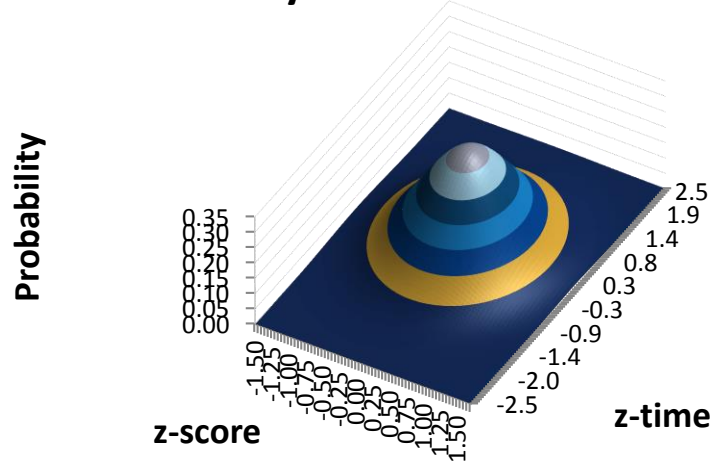
Graphing

Bivariate Standard Normal Distribution Density Function: z-score & z-time



Graphing

Bivariate Standard Normal Distribution Density Function: z-score & z-time



Graphing

Bivariate Standard Normal Distribution Density Function: z-score & z-time

