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Bringing Shrek to Life: Software Testing at DreamWorks

Presented by:

**Anna Newman,
Dreamworks Animation**

Presented at:

The International Conference on Software Testing Analysis and Review
October 22-26, 2007; Anaheim, CA, USA



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Anna Newman

Anna Newman is the DreamWorks Animation Quality Assurance Manager. She has 15 years experience in Quality Assurance managing testing in a diverse set of environments. Anna has built and managed QA teams for ecommerce at CommerceOne, desktop publishing for Adobe, and internet applications at Intuit. She has found her true calling "peeling the onion" of animation software. To build a great QA department you must also become a world class service organization, and Anna and her team have been rewarded with film credits for their efforts at DreamWorks Animation. Anna has presented on computer graphics and testing at SIGGRAPH 2004, and organizes and hosts the annual QA Birds of a Feather session at SIGGRAPH.

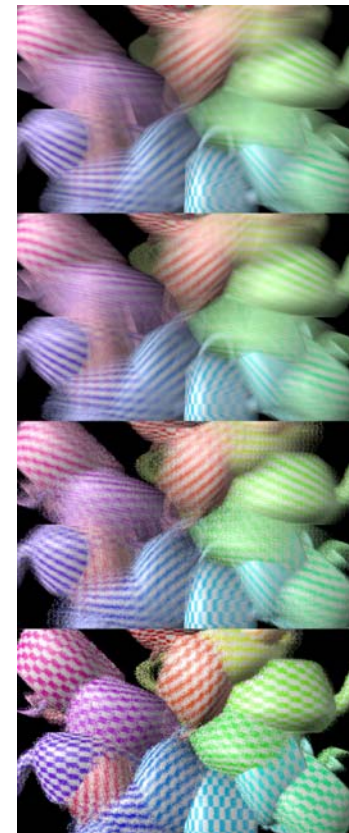
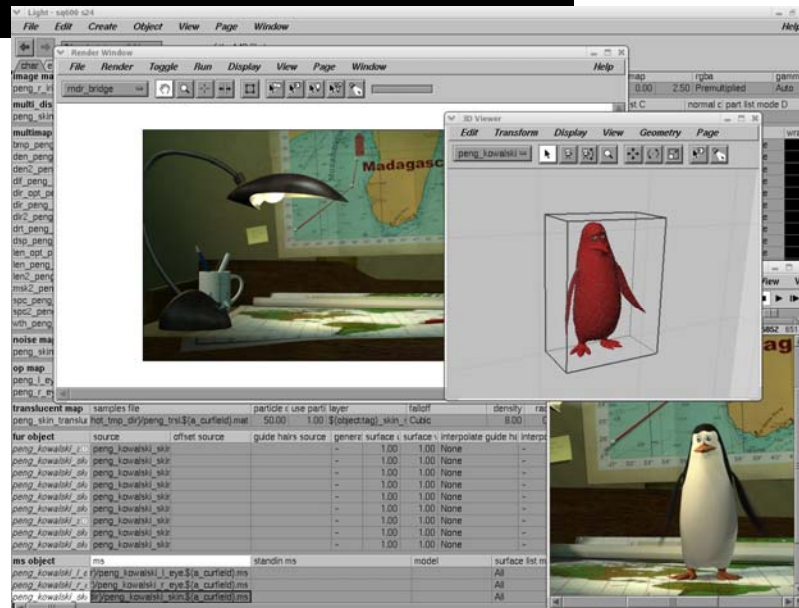
Bringing Shrek to Life: Software Testing at DreamWorks Animation

Anna Newman
QA Manager
DreamWorks Animation

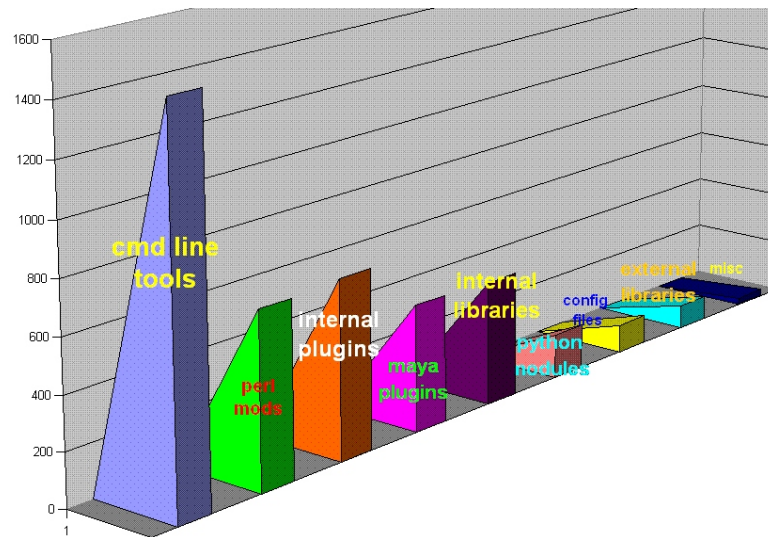
We Don't "Watch the Movies from Many Angles"



We Do Test Proprietary Tools



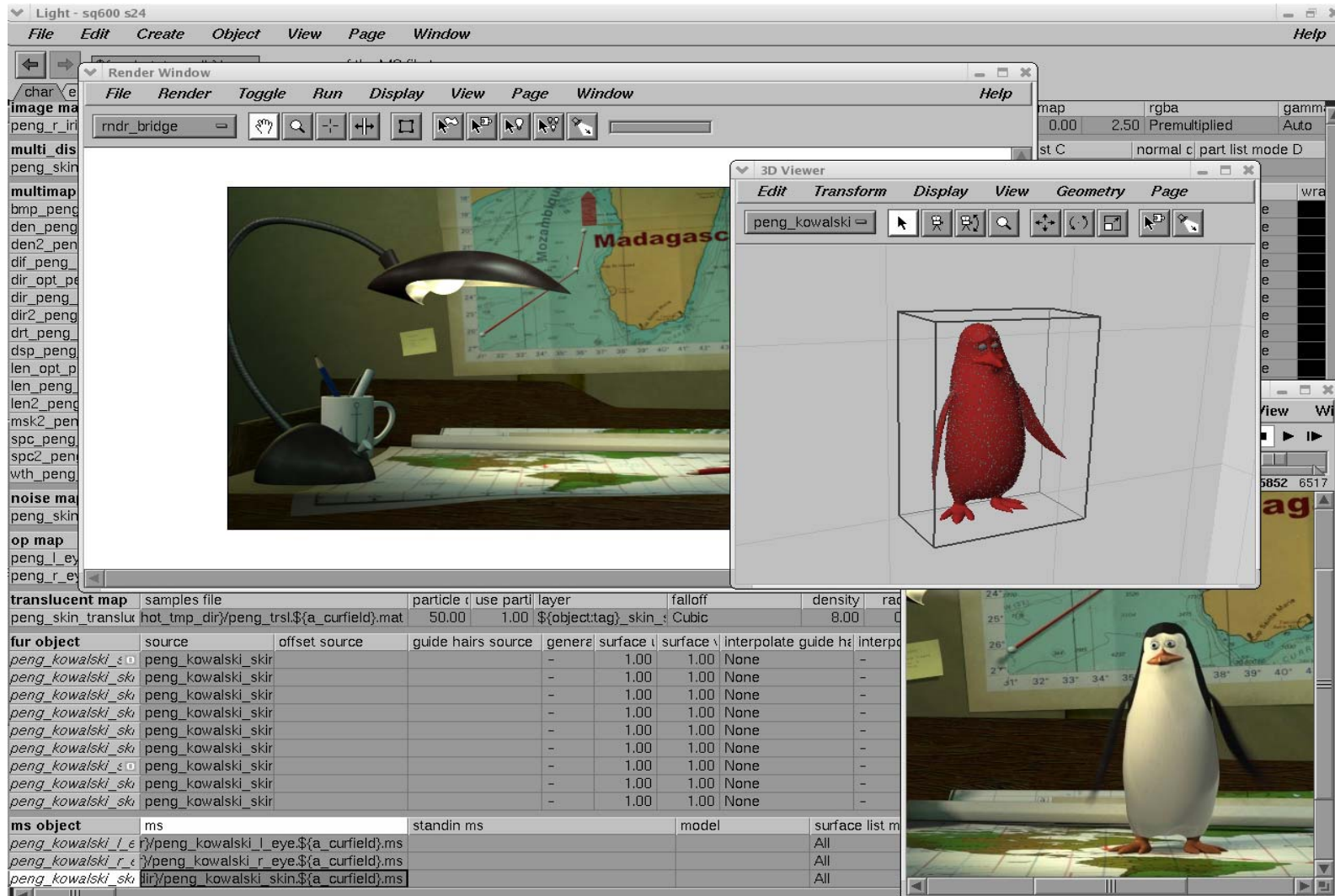
A Large Toolset With Legacy Code Developed Over 20 Years



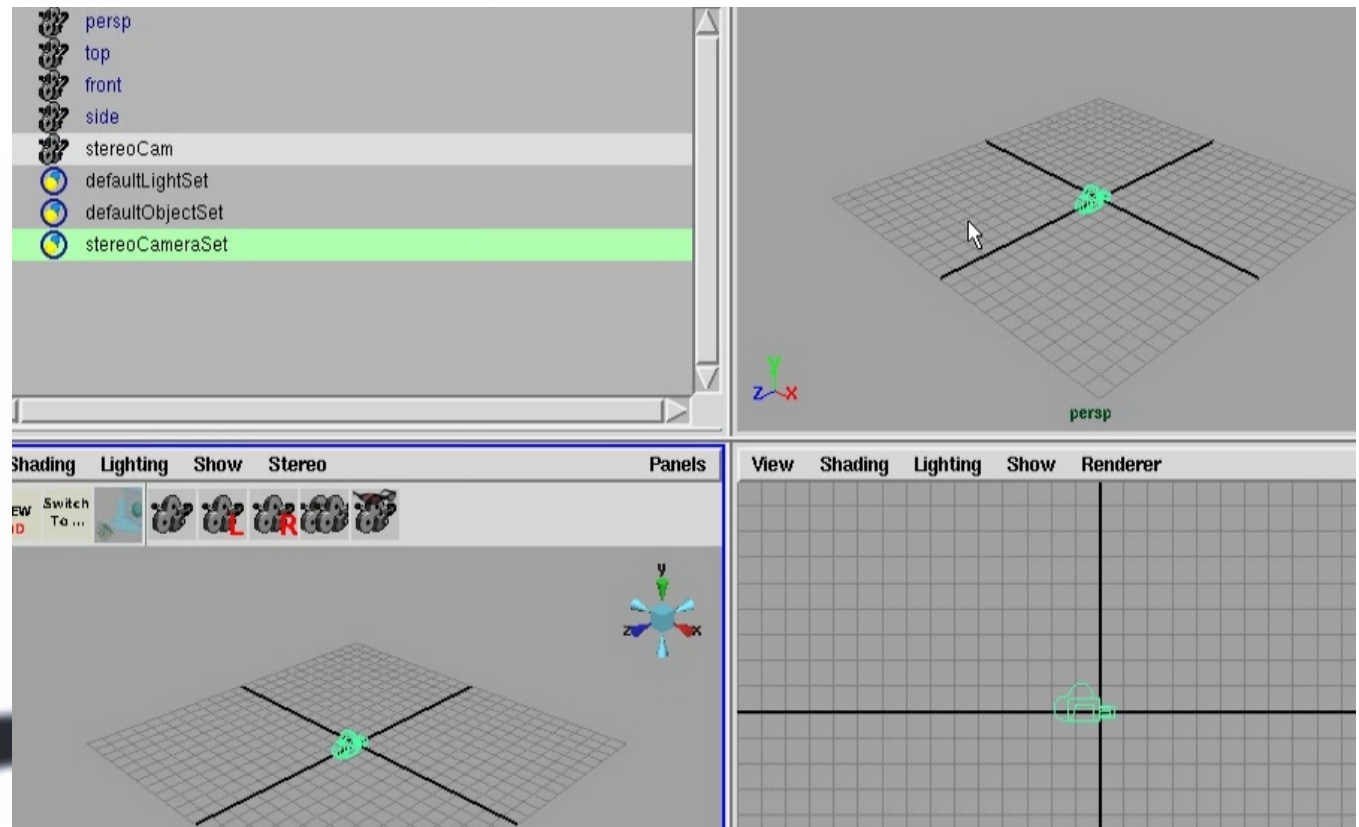
Number of tools/modules/libs



Complex Toolset






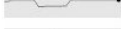


Heavily Customized Third Party Apps





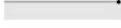
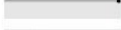

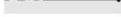
Multi-configuration Testing

Test Summary - Jul 17




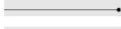
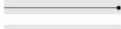

Rig

Version	Date	Host	Purify	Failure Ratio	Tests	Failures	New Failures
WS4 32.dbl.dev	Jul 17	mangle	--		58	1	1
WS4 32.dbl	Jul 17	mangle	--		58	0	0
WS4 64.dbl.dev	Jul 17	salem	--		58	2	2
WS4 64.dbl	Jul 17	salem	--		58	8	2
WS3 32.dbl.dev	Jul 17	vanquish	--		58	2	2
WS3 32.dbl	Jul 17	vanquish	--		58	8	2

Emo

Version	Date	Host	Purify	Failure Ratio	Tests	Failures	New Failures
WS4 32.dbl.dev	Jul 17	mangle	--		3	2	0
WS4 32.dbl	Jul 17	mangle	--		3	2	0
WS4 64.dbl.dev	Jul 17	salem	--		3	3	0
WS4 64.dbl	Jul 17	salem	--		3	3	0
WS3 32.dbl.dev	Jul 17	vanquish	--		3	3	0
WS3 32.dbl	Jul 17	vanquish	--		3	2	0

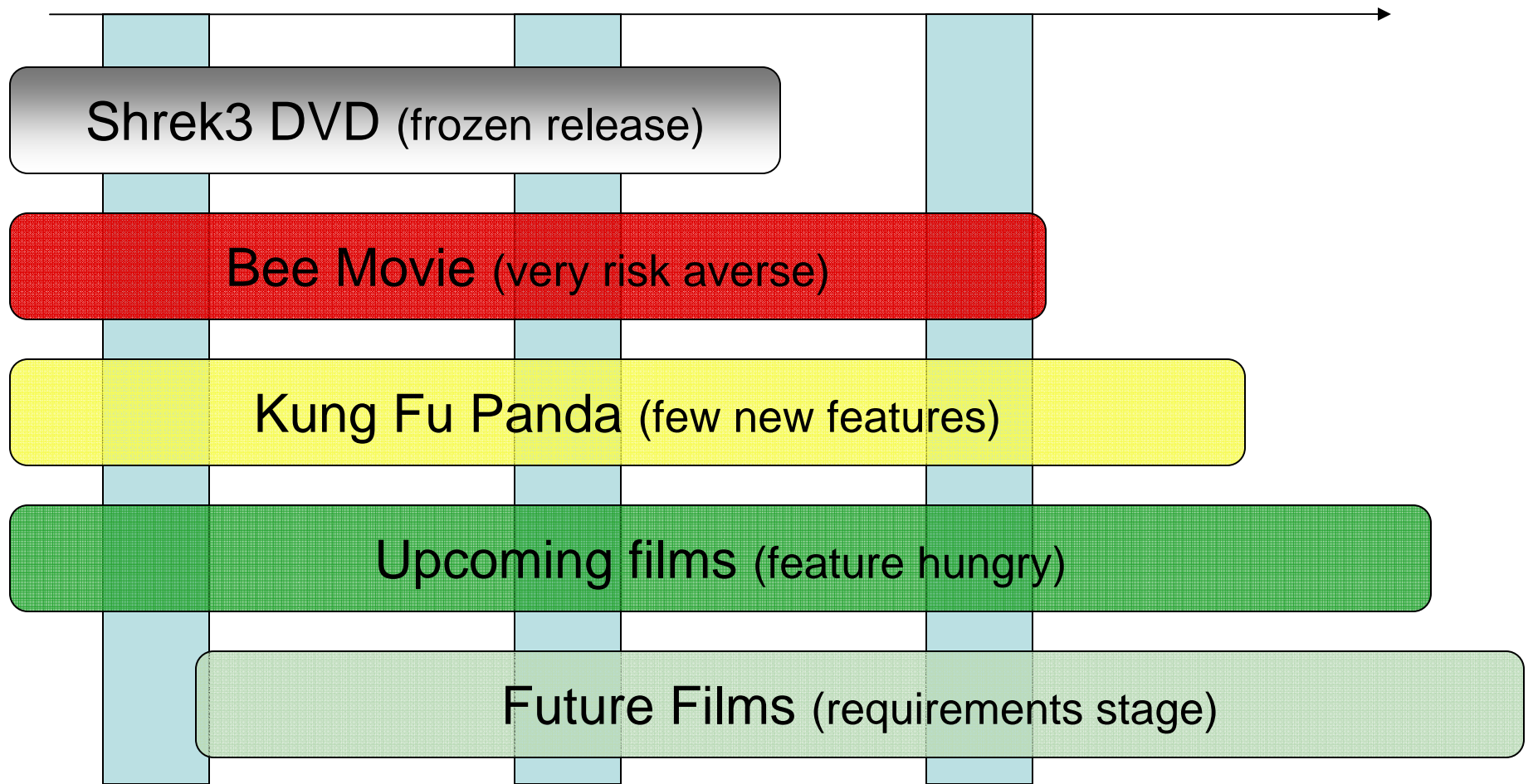
RaTS

Version	Date	Host	Purify	Failure Ratio	Tests	Failures	New Failures
DEV 64.dbl	Jul 17	op_farm	--		439	28	22
DEV 32.dbl	Jul 17	ox_farm	--		438	28	22
2007.07 64.dbl	Jul 17	op_farm	--		437	6	1
2007.06 64.dbl	Jul 17	op_farm	--		425	2	1
2007.05 64.dbl	Jul 17	op_farm	--		424	2	1
2007.04 64.dbl	Jul 17	op_farm	--		424	2	1

PeRCS

Version	Date	Host	Purify	Failure Ratio	Tests	Failures	New Failures
data.dev	Jul 16	mangle	--		3	3	1

In House Customers, But...



Help Dev Help You

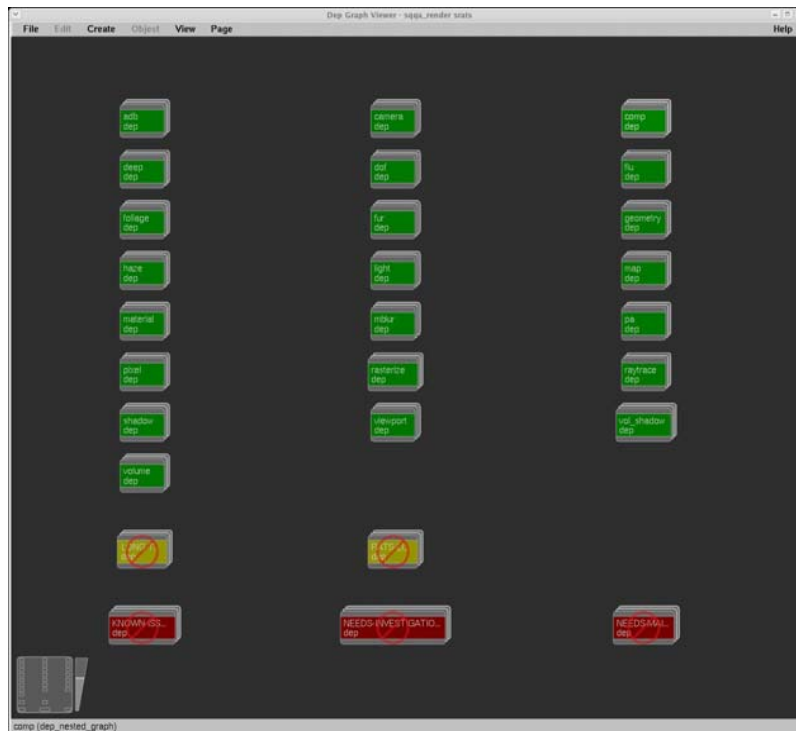


Enable Dev to Write QA Tests



[Wiki Templates and Documentation](#)

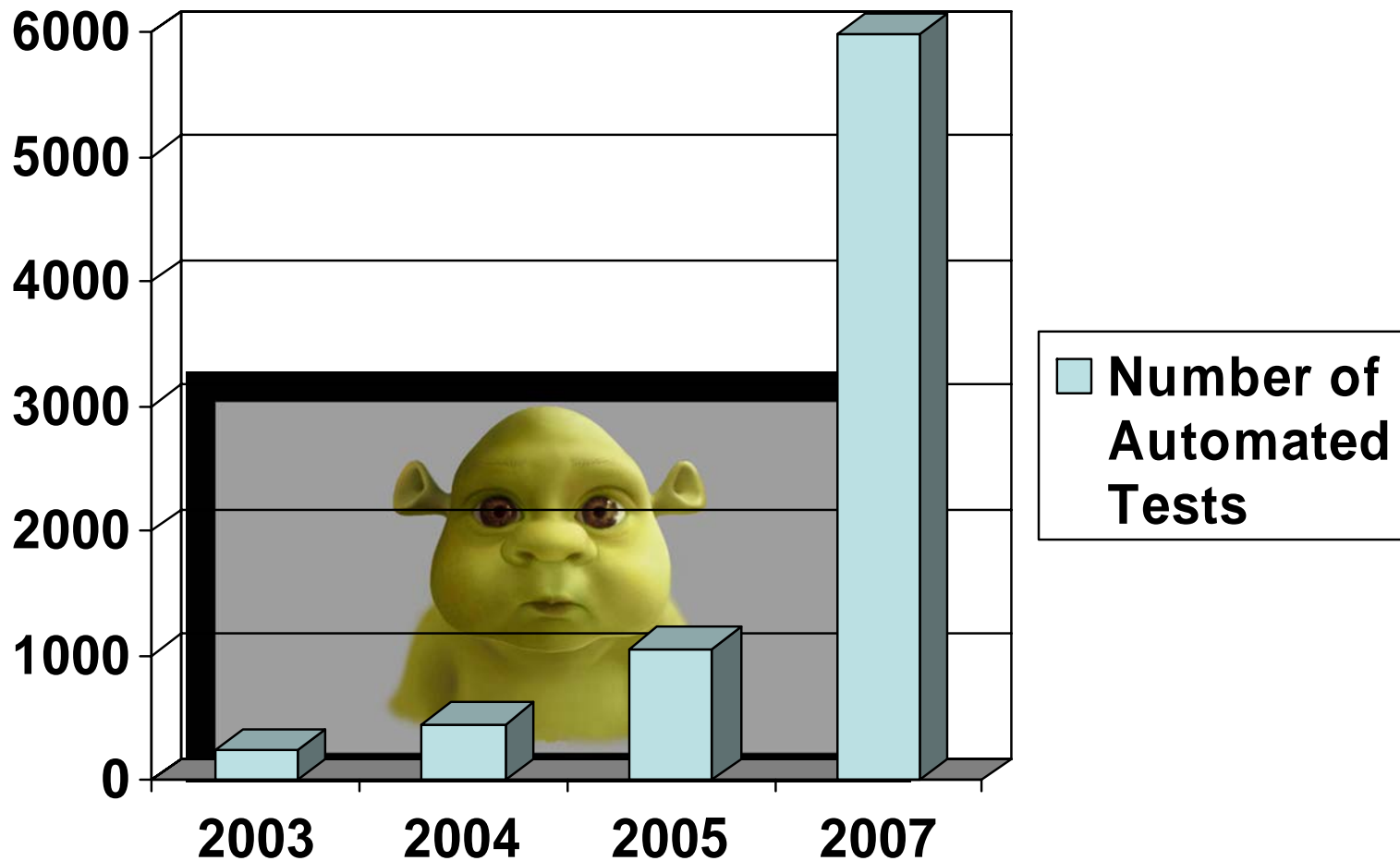
Enable Dev to Run QA Tests Too



variable	value
job_name	
queue	
share	
host	
log_dir	/studio/qa/shdw_test/rats/2007.07/test/render/log
qa_root	/studio/qa/shdw_test/rats/2007.07/test/render

un_rats_submit	execute	test path
cull/displacemen	✓	nder/viewport/cull/displacement_bounc
cull/rasterspace	✓	.07/test/render/viewport/cull/rasterspac
plusvp	✓	rats/2007.07/test/render/viewport/plusv
shrekeyes_plus	✓	?/test/render/viewport/shrekeyes_plus
subvp/cypress_s	✓	st/render/viewport/subvp/cypress_subv
subvp/subvp_cm	✓	test/render/viewport/subvp/subvp_cmd

Developer Test Contributions Can Make a Huge Difference



Communication Makes or Breaks the Partnership with Dev



Instantly Understood by Busy Folks: Sparkline Summaries*

<http://info.anim.dreamworks.com/rig/home/regression.html>

[Rig Crash trend last 2 months](#) 

Questions: [wbilton](#) [jwilliams](#) [kurt](#)















*See <http://www.edwardtufte.com> for more info about sparklines





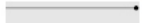







QA Dashboard: Also Uses Sparklines

Test Summary - Jul 10

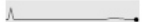

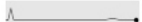

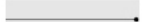

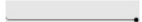

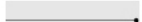

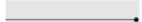

Rig

Version	Date	Host	Purify	Failure Ratio	Tests	Failures	New Failures
WS4 32.dbl.dev	Jul 10	mangle	--	 	58	51	0
WS4 32.dbl	Jul 10	mangle	--	 	58	9	0
WS4 64.dbl.dev	Jul 10	saalem	--	 	58	58	0
WS4 64.dbl	Jul 10	saalem	--	 	58	58	0
WS3 32.dbl.dev	Jul 10	vanquish	--	 	58	51	0
WS3 32.dbl	Jul 10	vanquish	--	 	58	8	0

Emo

Version	Date	Host	Purify	Failure Ratio	Tests	Failures	New Failures
WS4 32.dbl.dev	Jul 10	mangle	--	 	3	2	0
WS4 32.dbl	Jul 10	mangle	--	 	3	2	0
WS4 64.dbl.dev	Jul 10	saalem	--	 	3	3	0
WS4 64.dbl	Jul 10	saalem	--	 	3	3	0
WS3 32.dbl.dev	Jul 10	vanquish	--	 	3	3	0
WS3 32.dbl	Jul 10	vanquish	--	 	3	2	0

RaTS

Version	Date	Host	Purify	Failure Ratio	Tests	Failures	New Failures
DEV 64.dbl	Jul 10	op_farm	--	 	434	4	0
DEV 32.dbl	Jul 10	ox_farm	--	 	435	5	0
2007.06 64.dbl	Jul 10	op_farm	--	 	422	0	0
2007.05 64.dbl	Jul 10	op_farm	--	 	422	0	0
2007.04 64.dbl	Jul 10	op_farm	--	 	421	0	0
2007.03 64.dbl	Jun 13	op_farm	--	 	407	2	1

Suite Level Detail

Tests for Cf.64.dbl-2007.03 - 13 Jun 2007

Total New Failures: 0
Total New Successes: 0

Total Passed: 405
Total Failed: 2

Change in Total Execution Time:  0.0 seconds
Change in Maximum Memory Usage:  0 Bytes

Key

- × New Failure
- Old Failure
- Success

Graphs show:

Validation


adb

[class-layer light mask](#)

 27.0 seconds

camera

[registration-cubes](#)

 2 minutes 1.0 second

[shaders-orthographic fx](#)

 17.0 seconds

comp

[filter-blur](#)

 23.0 seconds

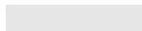
[filter-sobel](#)

 15.0 seconds

[miscellaneous-comment](#)

 7.0 seconds

• [miscellaneous-external command](#)



failed

[miscellaneous-make bump](#)

 17.0 seconds

Test Level Details

miscellaneous-external command: Unknown Failure

↑ previous | [next](#) ↓

Output File: /studio/qa/shdw_test/rats/data/2007.03/Validation/comp/miscellaneous-external_command

Output:

```
=====
JOB STARTED
Job ID       : 463973
Job Index    : 101
Job Name     : dderyke|2957055|cf|sqqa_render|srats|render_run|0|render|
Queue       : qa
Execution Host : op123
Netcache    : pdinc6
Start Time   : Wed Jun 13 06:59:59 2007
=====

Working Directory:
-----
/studio/cf/rndr/prod/sqqa_render/srats

Batch Job Env:
-----
sourcing b_job_env for prod: cf seq: sqqa_render shot: srats

Command:
-----
/rel/map/cf.64.dbl-2007.03/bin/run -exit_on_full -ani_set a_coremap_name
cf.64.dbl-2007.03 -ani_set a_shared_tmp_dir_name tmp_tree_A -ani_set
```

Last Successful Run Date: Never

Bring up the Debugger: cd /studio/qa/shdw_test/rats/data/2007.03/Validation/comp/
ddd /rel/map/cf.64.dbl-2007.03

Log File: /studio/qa/shdw_test/rats/data/2007.03/Validation/comp/miscellaneous-external_command

Push, Don't Just Publish

Subject: FAILED: RATS - kfp.64.dbl-2007.08 Sat Jul 7 09:35:50 2007
From: Dennis DeRyke <Dennis.DeRyke@pdi.dreamworks.com>
Date: 07/07/2007 09:35 AM
To: qa-rats-reports@dreamworks.com, rnd-double@dreamworks.com,
rnd-64bit@dreamworks.com

RATS (DreamWorks Animation Render Acceptance Test Suite)

Web based reports:

http://dept.anim.dreamworks.com/qa/cgi-bin/index.cgi/RaTS_Summary

DATE: Sat Jul 7 09:35:50 2007
ENV: kfp.64.dbl-2007.08
STATUS: FAILED

[5] failed tests found.
[431] passed tests found.
[436] total test results found.

See <http://people.anim.dreamworks.com/~dderyke/rats/Rats/kfp.64.dbl-2007.08.html> for:

- 1) A list of failed test cases.
- 2) Instructions for comparing expected images against resulting images.
- 3) Instructions for re-running the tests.

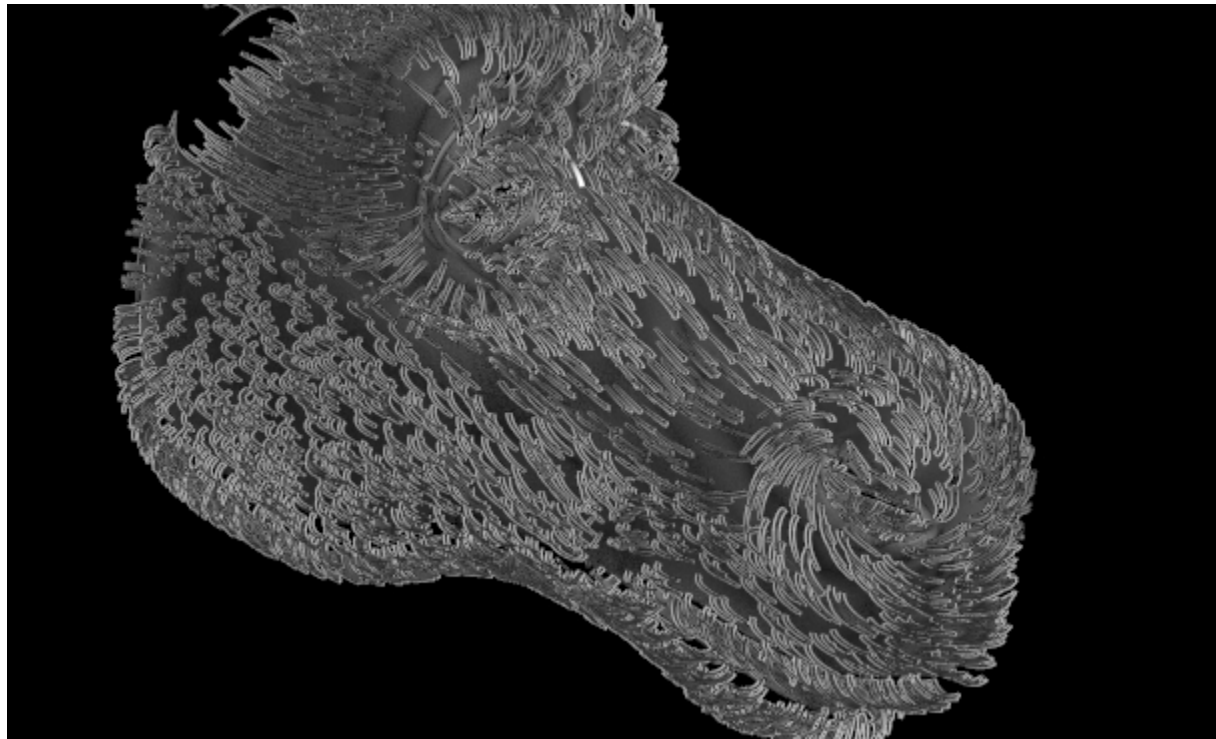
List of Failed Tests:

comp/transform/resize
comp/transform/scale
comp/transform/transform
fur/mm_simple
material/shaders/wax/simple_transmittance

The Closer: Cut & Paste Problem Reproduction



Critical: Eliminate False Positives



Open source Perceptual Diff'ing tool by Hector Yee
Available for Download: <http://pdiff.sourceforge.net>

Success!



Subject:Re: FAILED: RATS - bees.64.dbl-2007.04 Wed Apr 25 10:00:46 2007

Date:Wed, 25 Apr 2007 11:27:23 -0700

From:B.Developer

To:D.QA

CC:rats-report

These failures were caused by my patch to the ani library (see

http://supportq.anim.dreamworks.com/cgi-bin/Support0?cmd=view_case&arg=192650)

The shading library and dsos have been fixed and rebuilt. I re-ran these tests and they're passing now.

-B

D. wrote:

> RATS (DreamWorks Animation Render Acceptance Test Suite)

> -----

>

> Web based reports:

> http://dept.anim.dreamworks.com/ga/cgi-bin/index.cgi/RaTS_Summary

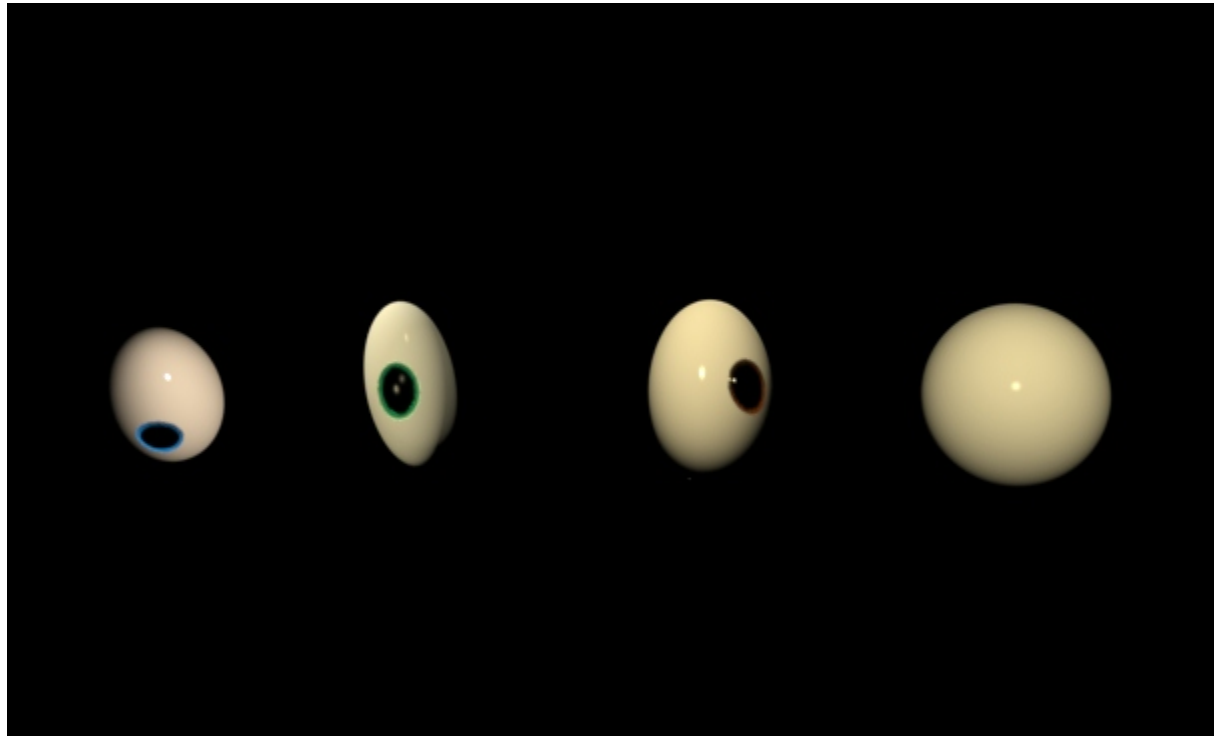
>

> DATE: Wed Apr 25 10:00:46 2007

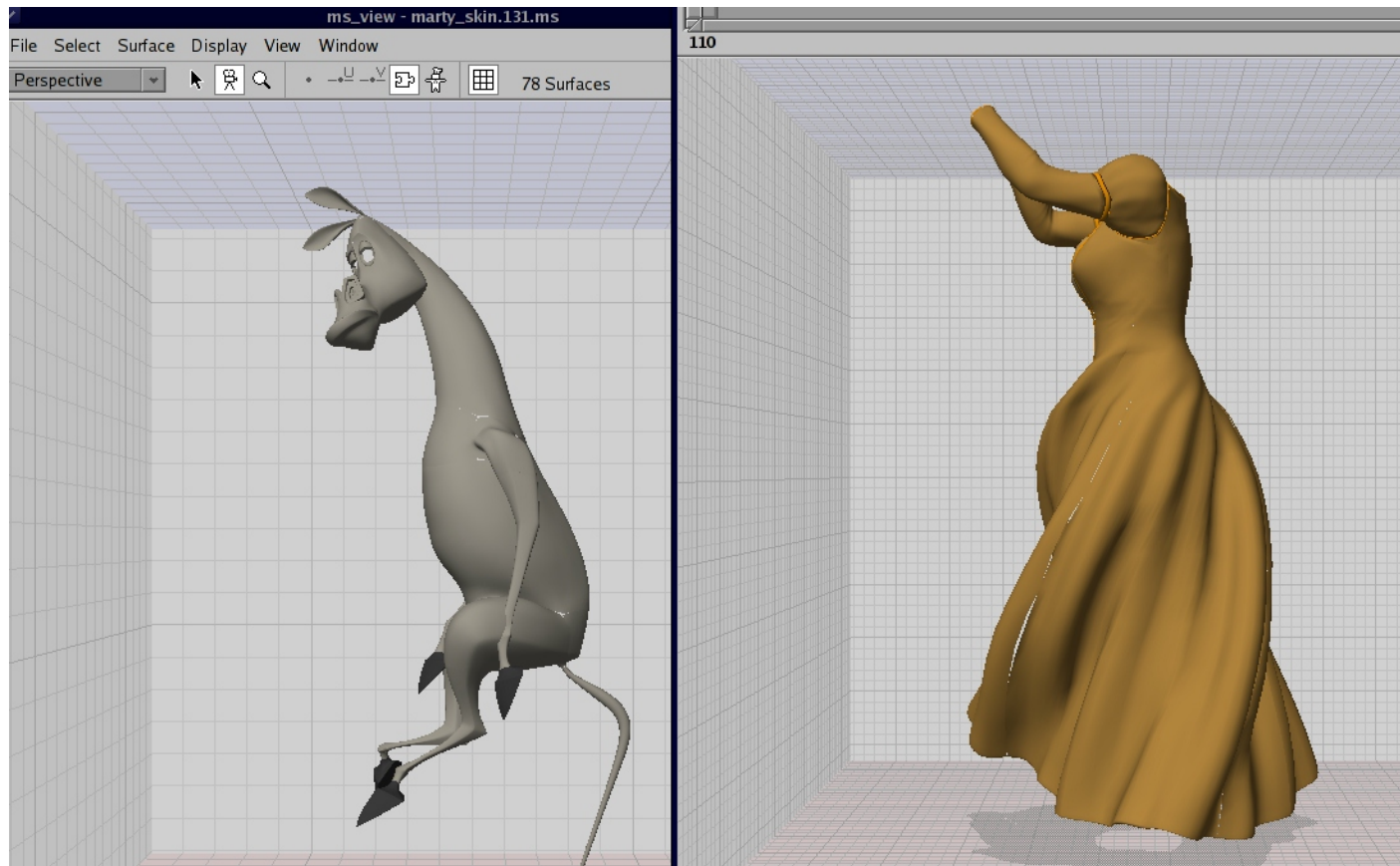
> ENV: bees.64.dbl-2007.04

> STATUS: FAILED

Limited Specs? Use Bugs to Identify High Risk Areas & Create Hybrid Unit/Functional Tests



Work With Customers To Identify High Impact Areas



Exploit Indirect Testing: Example Render Test



Customer Communication Ideas

- ***Daily Testing Status Newsletter anyone can receive***
- ***Regular meetings between QA and key customers: how can we help you?***
- ***Know your customer's concerns and advocate***

Developer Communication Ideas

- ***Daily Automated Test results that can be cut and pasted to reproduce***
- ***Regular meetings between QA technical leads: How can we help you?***
- ***Regularly ask Dev for unit tests you can take over to extend test suites***
- ***Submit your own feature requests for automation hooks; mine your bug data to demonstrate the value***
- ***Take over the creation of Release Notes: forces your team to really learn what is in each release***

Management Communication Ideas

- ***Subscribe your management to your testing newsletter***
- ***Subscribe your management to your automation results, or at least summarize them weekly***
- ***Atta-boys to developers who help QA; copy their manager and yours***
- ***Share what you learn meeting with customers with your management and development***

More Management Wrangling

- ***Be realistic about what you can and cannot test***
- ***Communicate constraints to Management and Development***
- ***Explain your prioritizations***
- ***Publish coverage information***
- ***Be willing to change your priorities if needed.***

Don't Freak Out

- ***Focus on what you CAN do, and reward your team for doing it***
- ***Automate, automate, automate***
- ***Present your tools and progress at department show and tell***
- ***Sleep at night...tomorrow is another day***

Happily Ever After

*It may be a swamp, but it's
YOUR swamp.
Love every slimy bit of it.*

