VISUALIZING DATA AT NORTHWESTERN UNIVERSITY

Matt McCrory
Lead Visualization Engineer
MATT MCCORY

Lead Visualization Engineer

- Lighting Artist/Tech Director at DreamWorks Animation
- Visualization Engineer at University of Chicago
- Visualization Engineer at Argonne National Lab
MATT MCCRORY
Lead Visualization Engineer
WHAT IS VISUALIZATION?

Data ➔ Imagery
### WHAT IS VISUALIZATION?

#### Data Imagery

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Data ➔ Imagery
WHAT IS VISUALIZATION?

N-body

“Big Data”

Imaging Z-stack

OBJ

DICOM

HDF

Imagery

PDB
WHAT IS VISUALIZATION?

N-body

DICOM

HDF

Imaging Z-stack

“Big Data”

Interactive Illustration Animation

OBJ

PDB
WHAT IS VISUALIZATION?

N-body

“Big Data”

DICOM

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HDF

Idea!

Obj

Interactive

Illustration

Animation

PDB
Interactive

Explore
Interrogate
Discover
Quantify
Interactive

Native Apps

Local computation

Local data

Some portability
Interactive

Advanced Displays

Massive resolution

Stereoscopic 3D

Immersive

Collaborative
Interactive

Web Apps

Platform agnostic

Shareable

Mobile
Interactive

Cloud Rendering
51% of Americans believe storms affect cloud computing

A study has found that a large percentage of Americans are a little foggy on what cloud computing actually is.

by Michelle Starr / @riding_red
September 5, 2012 6:49 PM PDT  /  Updated: September 5, 2012 8:51 PM PDT
Interactive Cloud Rendering
Interactive

- GPU, compute, and data co-located in remote resource
- Platform agnostic
- Highly portable
- Collaborative
- Centralized app development
- Massive data visualized on low power devices
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Interactive

Cloud Rendering

Demo!
Interactive

Tools

**Workstation Apps** - C/C++, Python, OpenGL, Matlab, R, Mathplotlib, VTK, Paraview, VisIt

**Advanced Displays** - C/C++, OpenGL, TCP/IP message passing, frameloocking hardware/software, tiling framework

**Web Apps** - D3JS, HTML5, WebGL, IPython

**Cloud Rendering** - Workstation Apps Tools + more…

Learn more at The Researcher’s Toolkit Series - Visualization: Interactive Overview

ALESSANDRO FEBRETTI

Senior Interactive Visualization Specialist

- Completing a Ph.D. at UIC’s EVL
- Software Engineer at Milestone Games
- Developed software framework for CAVE2
- Experience developing native apps, web-based apps, advanced displays, and cloud-based apps
Illustration

Convey scientific understanding in a way that words alone cannot.
Illustration
Understand and depict the progression of data over time.
Animation

The Animation Pipeline

The processes and tools needed to take an animation from concept to final product.
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The processes and tools needed to take an animation from concept to final product.
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The Animation Pipeline
The processes and tools needed to take an animation from concept to final product.

Pre-Production
- Data & Asset Assembly
- Pre-Visualization
- Visual Direction

Production
- Modeling/Rigging
- Animation
- Surfacing/Lighting
- Rendering/Compositing
Animation

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2D motion graphics present information in a clean, noncomplex visual style.
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Animation

Maya
http://www.autodesk.com/education/free-software/maya

Nuke
https://www.thefoundry.co.uk/education/student-license

After Effects
https://northwestern.onthehub.com/

Tutorials
http://molecularmovies.org
JUSTIN MUIR
Senior Animation Specialist

- 20 years working in the gaming industry

- Art Manager at Day 1 Studios on Silent Scope, Fear 3

- Director of Animation at Midway Games

- Expert in digital animation tools
JUSTIN MUIR
Senior Animation Specialist
How can we help?

Working with Northwestern Visualization

- General questions
  
  “Does visualization software exist that does x, y, z?”

- Guidance on viz project complexity and costs
  
  Projects aren’t always as complex as you might think

- Grant proposal input
How can we help?

Working with Northwestern Visualization

1. visualization.northwestern.edu - “Request a consultation”
2. Initial consultation to understand your needs
3. Existing solutions?
4. If not, preliminary investigation and production of pre-viz, animatics, or proof-of-concept code.
5. Quote generated, revisions made if needed (recharge rate of $60/hour)
6. Iterate with researcher until completion
Thank you!

Matt McCrory
m-mccrory@northwestern.edu

Northwestern Visualization
visualization.northwestern.edu

The Researcher’s Toolkit Series - Visualization: Interactive Overview