VISUALIZING DATA AT NORTHWESTERN UNIVERSITY

Matt McCrory
Lead Visualization Engineer
MATT MCCROY

Lead Visualization Engineer

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

Data ➡ Imagery
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WHAT IS VISUALIZATION?

N-body

“Big Data”

DICOM

Ideas!

HDF

Imaging Z-stack

OID

Interactive Illustration

Animation

PDB

PROTEIN DATA BANK
Interactive

Explore
Interrogate
Discover
Quantify
Interactive

Native Apps

Local computation

Local data

Some portability
Advanced Displays
Massive resolution
Stereoscopic 3D
Immersive
Collaborative

Interactive
Web Apps

Platform agnostic

Shareable

Mobile

Interactive
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

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

Cloud Rendering

Demo!
Interactive

Tools

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

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

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

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

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*Upcoming workshops!*


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
ALESSANDRO FEBRETTI
Senior Interactive Visualization Specialist
Convey scientific understanding in a way that words alone cannot.
Understand and depict the progression of data over time.
Enhance pedagogy with informative visuals.

Animation

https://www.coursera.org/learn/reproductive-health
Animation

The Animation Pipeline
The processes and tools needed to take an animation from concept to final product.
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- Data & Asset Assembly
- Pre-Visualization
- Visual Direction

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

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

**Nuke**
https://www.thefoundry.co.uk/products/nuke/non-commercial/

**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
JUSTIN MUIR
Senior Animation Specialist
How can we help?

- **General questions**
  “Does visualization software exist that does _______?”

- **Small scale visualizations**
  No cost

- **Large scale visualizations**
  No cost for consultations or preliminary work

- **Guidance on visualization complexity and costs**
  We can assist with grant proposals that provide visualization funding
What's the process?

1. [visualization.northwestern.edu](http://visualization.northwestern.edu) - “Request a consultation”
2. Initial consultation to understand your research & viz needs
3. Existing solutions?
4. Preliminary investigation and production of pre-viz or proof-of-concept code.
5. For big projects, generate cost estimate (recharge rate of $60/hour)
6. Iterate with researcher until completion
Thank you!

Matt McCrory
m-mccrory@northwestern.edu

Northwestern Visualization
visualization.northwestern.edu

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