



ROUGH NOTES

November 24, 2009

Plenary Session 2

10:40am - 11:50am

Integrating Art, Science and Health; Medical Visualization

Panelists:

- Lincoln Stein, Platform Leader, Informatics and Bio-computing, Ontario Institute for Cancer Research
- Diane Gromala, Canadian Research Chair, Multidisciplinary and Multimedia Arts & Founding Director of Simon Fraser University's BioMedia Lab
- Nicholas Woolridge, Program Director, Biomedical Communications, University of Toronto

Moderator:

Christopher Paige, Vice President, Research, University Health Network

Notes by:

Alison Benjamin, Graduate Student, Faculty of Information, University of Toronto
Antonio Gamba-bari, Graduate Student, Faculty of Information, University of Toronto
Leah Maestri, Graduate Student, Interactive Arts & Technology, Simon Fraser University

Intro by Christopher Paige, UHN

Design has important roles and the benefits are clear.

Clear labeling, efficiency, safety. Visualization of data so it becomes more meaningful. Human factors. But how do we form a talent team that will do it best?

1st Presentation by Lincoln Stein, OICR

Visualizing Cancer Genomes

- * Look at the causes of Cancer, disease of the genome
- * Every tumor is different
- * Different sets of mutated genes may lead to similar tumors
- * Different tumor types may have similar sets of mutated genes

International Cancer Genome Consortium.

- Identify genomic abnormalities in 50 major cancer types
- Make the data available to the research community/public.

Challenges w/ visualization: scale of genome changes. (@genome, chromosoma, gene, base pair, network/pathway levels). How can we collaborate internationally?

Design challenges

- unify magnification scales & make interactive
- scale to visualize thousands of cancer specimens
 - * The Problem of Scale:

- o ~3,000,000,000 bases in the genome
- o ~10,000 changes in a cancer genome
- o ~6 changes will be significant
- make data accessible to lay community - provide layer of documentation & design
- * The problem of Integration
 - o Geographically difficult to meld all the information together
 - o Need the aid of the design community in helping doctors/researchers go from micro/macro scale of cancer information/visualizations

2nd Presentation by Diane Gromala, SFU

- * Who is part of the teams that work on visualization projects in the health space?

It depends on the context(s)

- + Who are the intended users
- + What skill sets are required? Desired? Valued?
- + Are the team members flexible?
- + When is it due?
- + Designer? Knowledge is contextual, affected by aspects of culture.

Projects worked on:

- * Meditation Chamber: interaction with physiological data changes in real-time, visuals, 3 layers....
- * Virtual Meditative Walk...
 - Looks at pain distraction to beyond VR "self-modulation"
- * "It Hurts Here" A toolbox for patients to deal with pain themselves, a holistic approach, body, mind & spirit.
- * A media form is more affective than opiates for treating pain.
- * For chronic pain, the approach isn't to cure but to devise a toolbox so pain can be managed.
- * How can the experts comprehend huge amounts of data?

3rd Presentation by Nicholas Woolridge, UofT

Coding & visualizing (thanks to advances in computer science) helps scientists interpret data.

- * Evolution of Epistemic Virtues
 - o Truth to nature
 - o Objectivity
 - o Trained judgment
- * Need to filter out visualizing / information from experts into lay terms
- * People learn better from application of medicine, not through diagrams
- * Explore effective depictive strategies
- * Window into a crucial moment of change in the medical field
- * Designers + Artists: visual invention and representation

Q & A / Discussion

1. Shift - from trained to untrained knowledge in the medical field... thoughts about data driven design? Is this new?
 - * Typically one collects lots of data from which patterns are derived
 - * One comes up with a hypothesis and you conduct experiments to prove your hypothesis
 - * We may have come to the point where there is no longer hypothesis. It's now far more explorative.
2. Who's curating the software build for this kind of information (on genomes?)
 - * Lots of people - wikipedia approach.
 - * There are lots of coordinators
 - * We need to start thinking about using a common vocabulary. One way to do this is through the use of Ontologies. This is the most precise and objective way.

- * Huge challenge.
- 3. Data-driven design: need to ensure authenticity and approaches to collecting data. Make this clear.
 - * Intent of the designer is a consideration
 - * How information is understood is not the same
- 4. Do you see visualization as boundless? Is there a limit? Are diagrams finite?
 - * Any language is limitless
 - * If there are bounds, they're not near.
 - * There are things that are expressionless