

Visualization Studio

Two Years of Experience at the University of Calgary

John Brosz & Shawna Sadler

CNI Spring Meeting
April 1, 2014



Presentation Outline

Shawna

1. Intent, mandate & strategy
2. Design with faculty & graduate students
3. Build phase
4. Pictures of the Visualization Studio
5. Policies
6. Hiring Manager, qualifications, job description

John

1. Marketing & awareness
2. Data analysis of useage
3. Examples of work
4. Evaluations
5. Upgrading
6. Lessons Learned

Taylor Family Digital Library



Library welcomes students

The Taylor Family Digital Library opens Sept. 6 with all six floors available for studying, research and collaborative learning.

The Vision

State-of-the-art Learning and Research Centre

Providing outstanding support for Scholarship, Learning and the Creation of Knowledge, Libraries and Cultural Resources is a key component in the University's Excellence in Research, Teaching and Community Service.

We will fulfill this vision through a convergence of our Libraries, Museum, Archives, Special Collections and University Press and through campus, community, national and international partnerships.

We Should Imagine Greatness



The Taylor as an Instrument of Research



Students

Faculty

Community Researchers

Themes

- **Agile** – All spaces and technology infrastructures must be easily adaptable to changing student and researcher needs
- **Contemporary** – Spaces and technologies must remain cutting edge, so to give our UofC Community unique access to innovation
- **Inspiring** – Technologies must leverage opportunities for our students and researchers in exciting new ways
- **Innovative** – The Library Technology staff must apply a high-level of creativity to selecting and employing technologies in the library



Visualization Studio

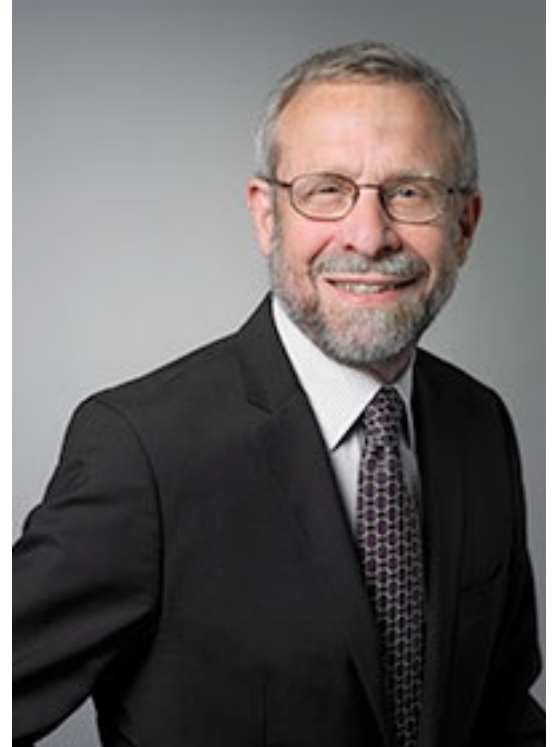


Intent

Dedicated space in the library for faculty and graduate students to conduct research with cutting edge technologies

Tom Hickerson

Vice Provost, Libraries and Cultural Resources, University Librarian
University of Calgary



Mandate

Provide meaningful space, technologies and services to enhance the research effort of the University of Calgary faculty and graduate students



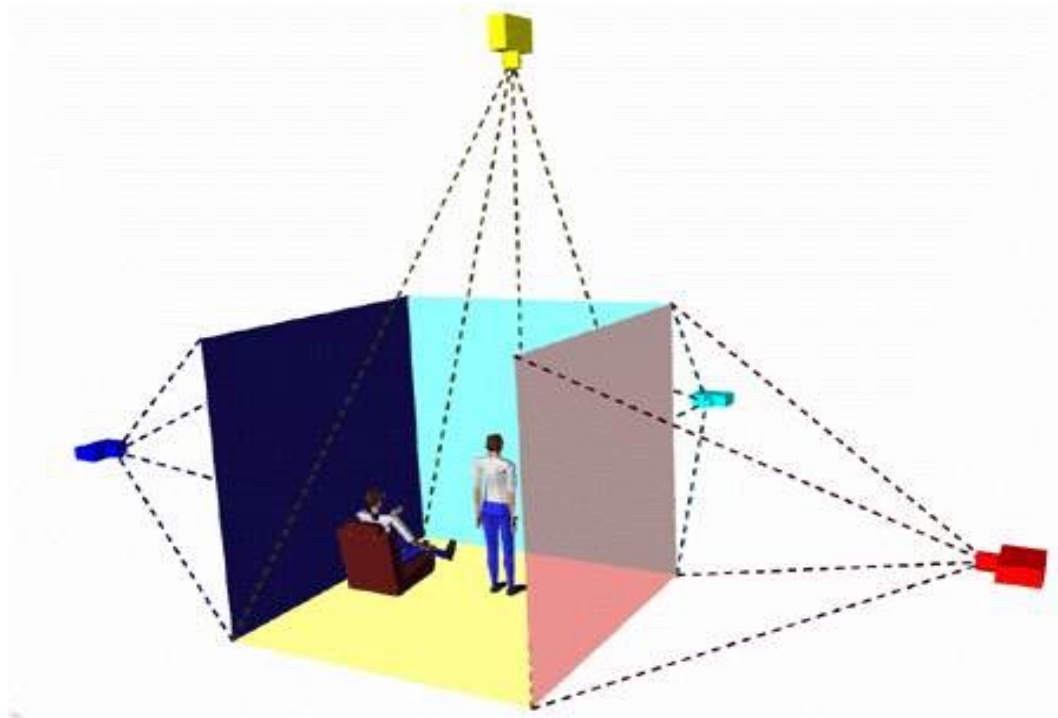
Strategy

Engage faculty and graduate students in the design, purchase, and operationalization of the new space.



Architecture Computer Science Environmental Design Geology Library Medicine Sociology

Original idea... 3D CAVE



Design with Faculty & Grad Students



Dr. Sheelagh Carpendale



Dr. Miguel Nacenta



Dr. Uta Hinrichs

Requirements from Researchers

1. An environment for collaborative discovery
2. Will allow you to do things that you can't at your desktop
3. Should be a similar experience to working on your computer
4. Future proof so the room can remain cutting edge for years to come
5. Dedicated staff to support researchers in the room
6. No bezels to interrupt the image(s) on the screen
7. Design to respect research data and the ethical use of using sensitive data
8. Keep policies to a minimum so not to constrain research activities

... Translation

1. An environment for collaborative discovery

Lots of moveable furniture, electrical plugs, good wireless infrastructure, virtual collaboration opportunities

2. Will allow you to do things that you can't at your desktop

Big screen, easily share content with colleagues, does not require special programming to run applications in the environment

3. Future proof so the room can remain cutting edge for years to come

Make sure your operating budget can keep this space useful

... Translation

1. Dedicated staff to support researchers in the room

We're tired of not having the support we need to conduct our research

2. No bezels to interrupt the image(s) on the screen

Example- dataset

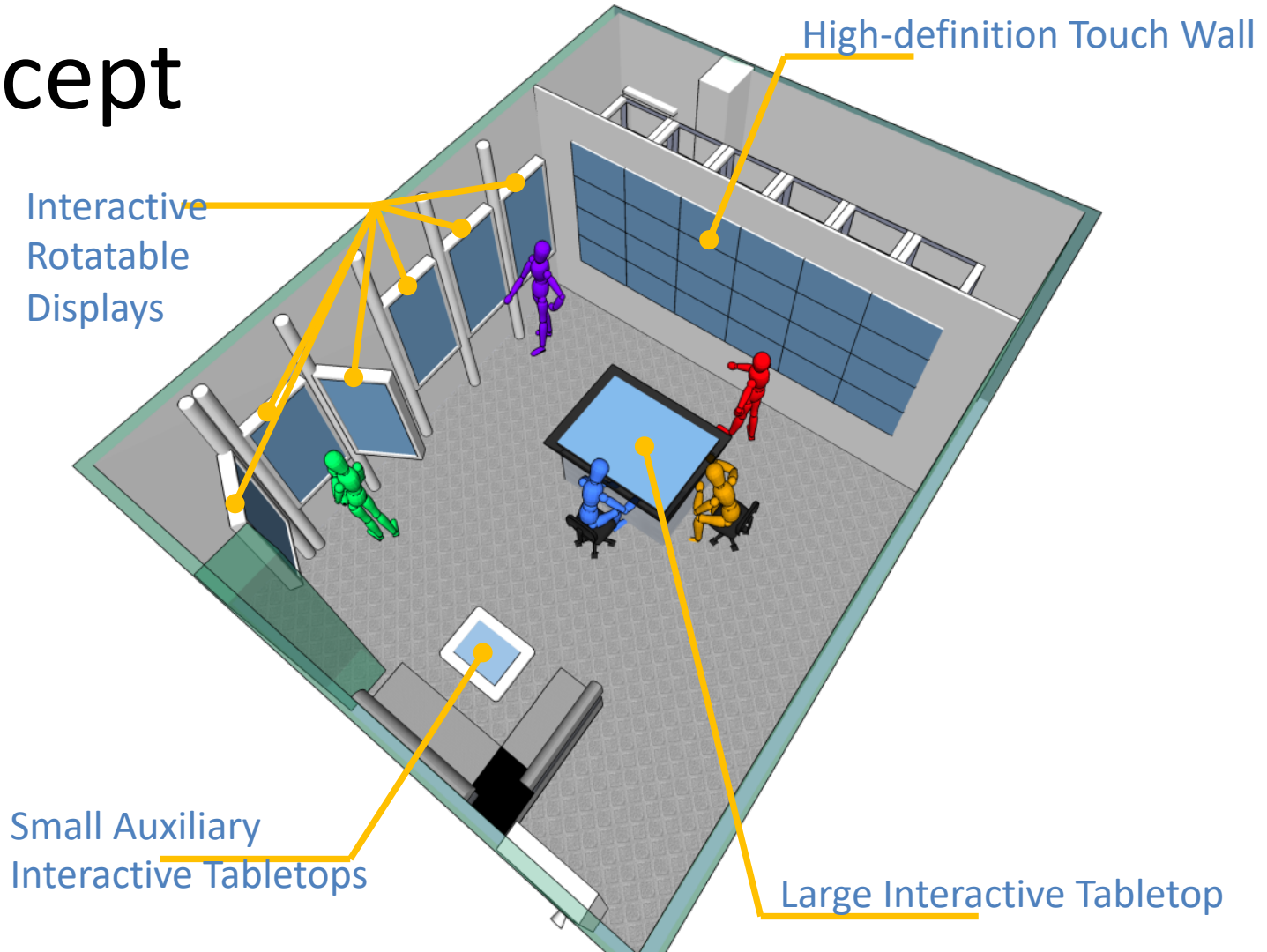
3. Design to respect research data & the ethical use of using sensitive data

Protect sensitive data, no windows, secure door, secure physical and virtual environment

4. Keep policies to a minimum so not to constrain research activities

Let me do what I need to do, ie. Cater and serve alcohol in the space

Concept



The New Design

- Hi resolution wall (touch or gesture)
- Configurable display wall (touch)
- Large central multi-touch table
- Several small multi-touch tables
- A sofa

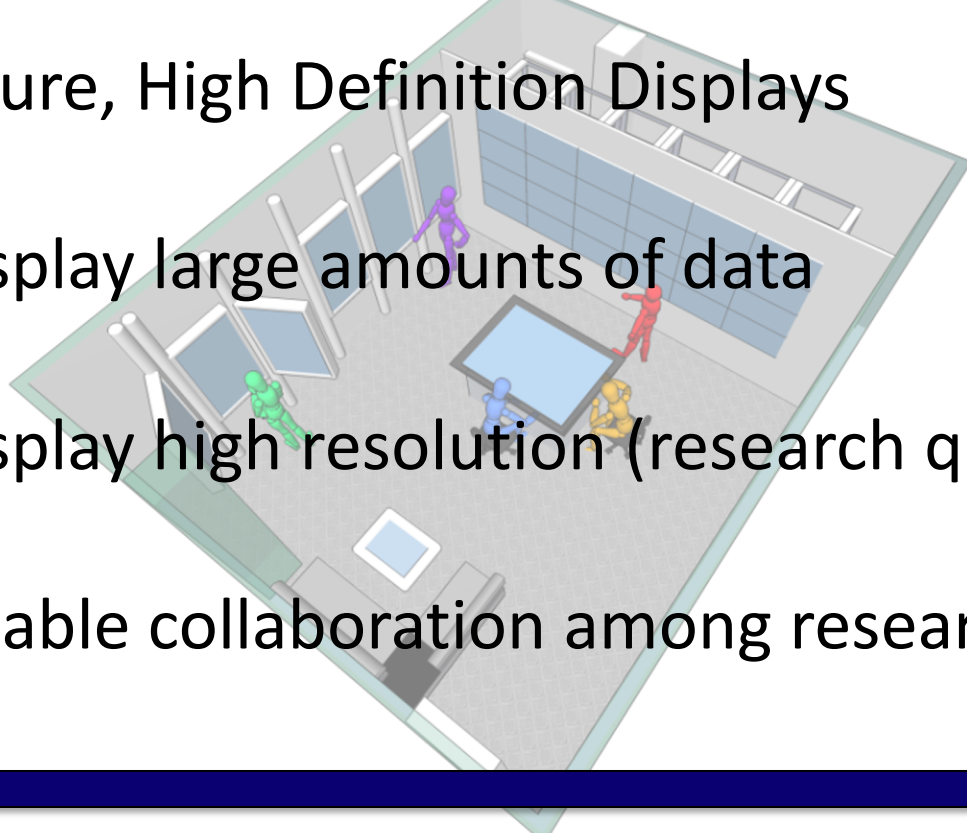
High Definition Displays

Key Feature, High Definition Displays

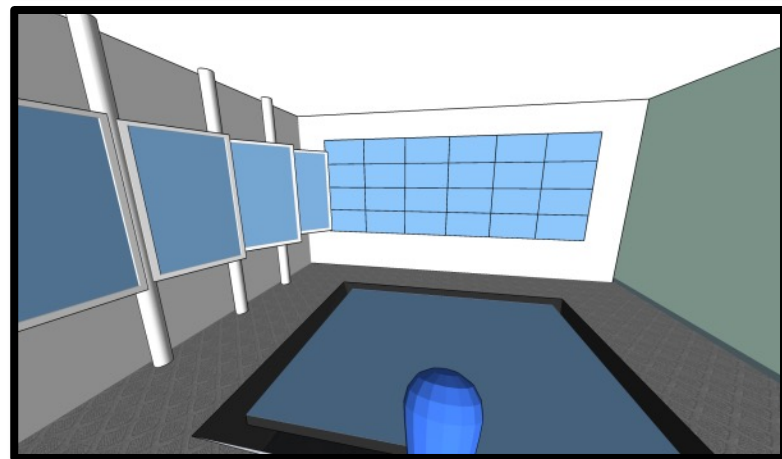
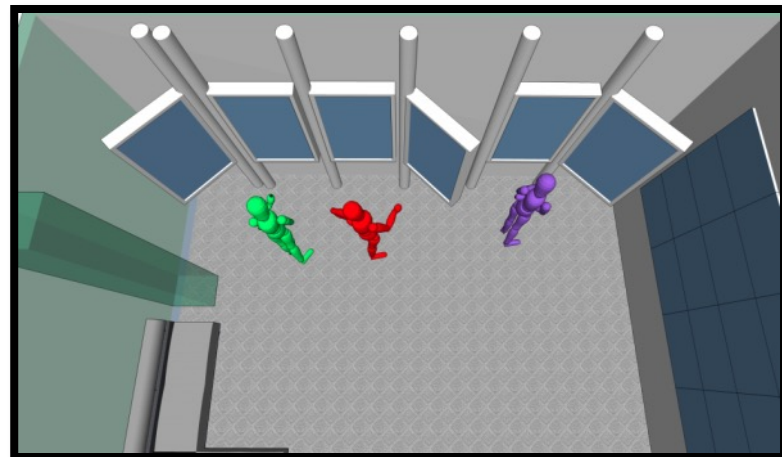
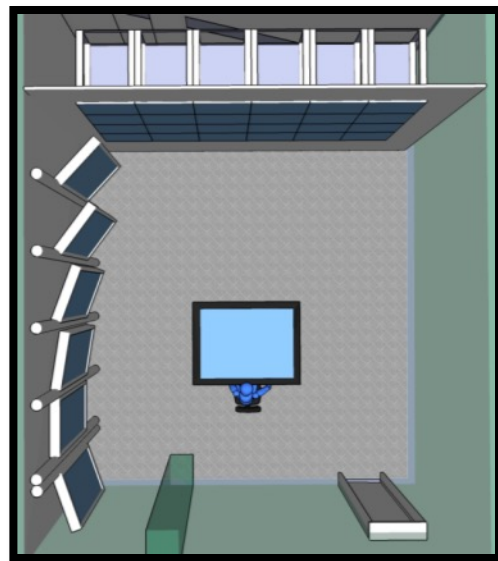
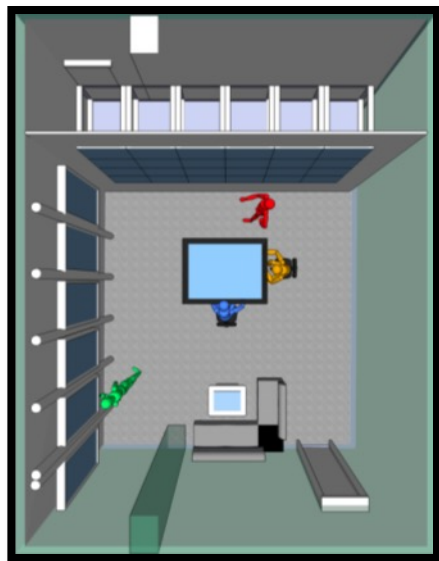
To display large amounts of data

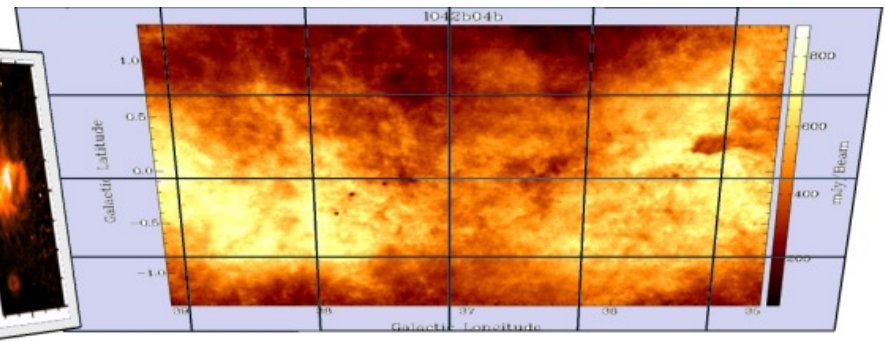
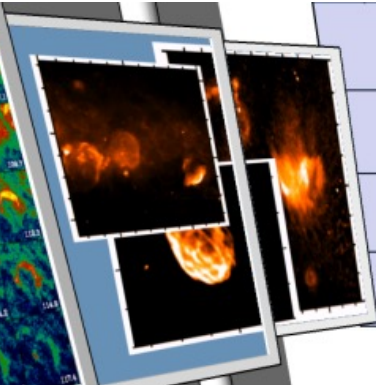
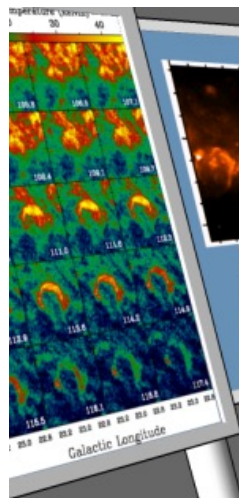
To display high resolution (research quality) data

To enable collaboration among researchers



Configurable Space

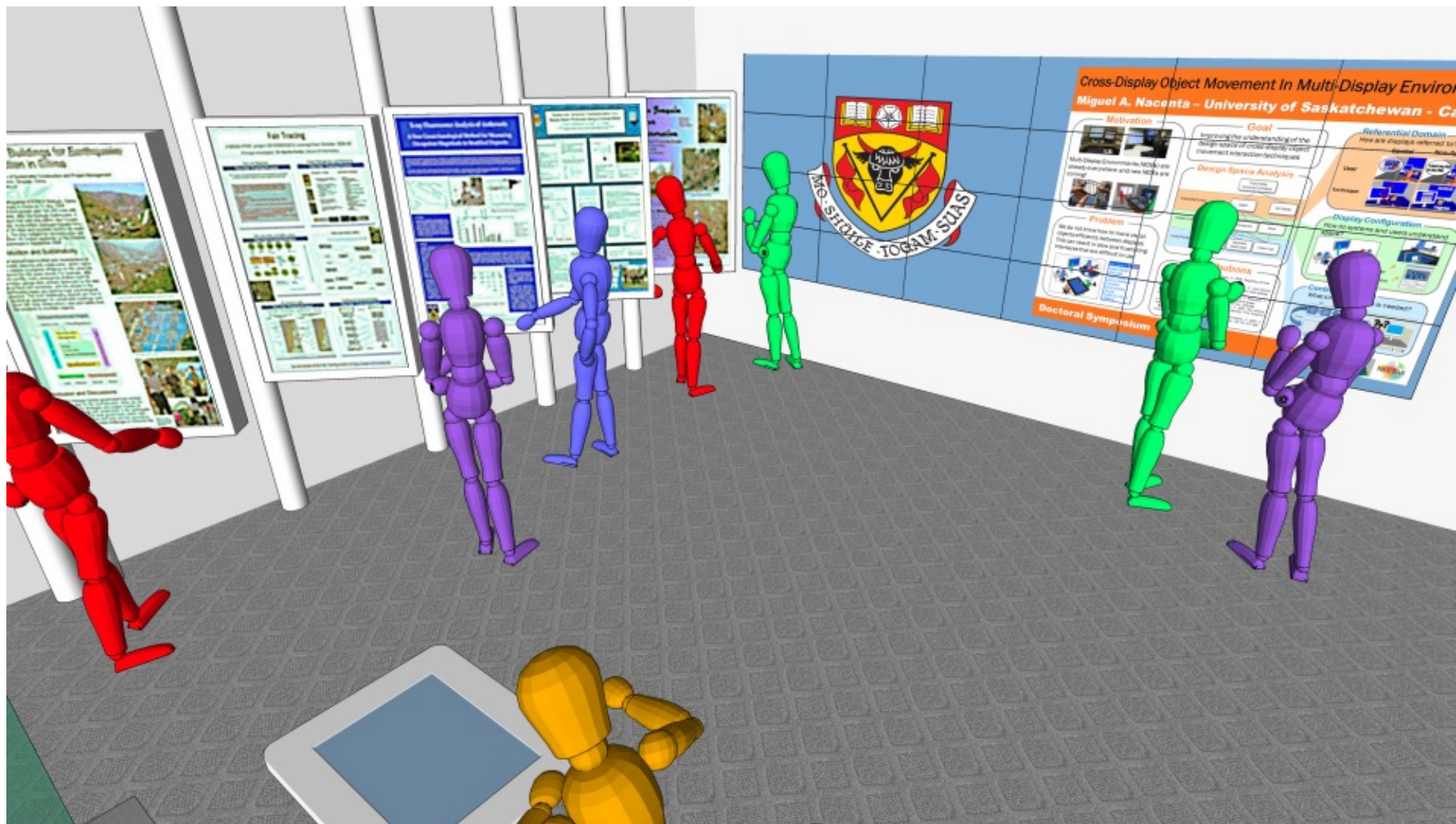




Interactive control panel for the galaxy visualization. It includes a central display showing a zoomed-in view of the galaxy with three red boxes highlighting specific regions. Below the display are several controls:

- Buttons for 'Filtered' and 'Annotated' (both currently unchecked).
- A 'Expand' button with a dropdown arrow.
- A 'Redraw' button.
- Two vertical sliders.
- Four horizontal sliders.
- A circular diagram on the right showing a spiral pattern.





Buildings for Earthquake Resilience in Climate

Abstract: The design of buildings and infrastructure must take into account the increasing frequency and intensity of natural disasters, particularly earthquakes and hurricanes. This paper discusses the challenges of designing buildings that are resilient to these events and presents a framework for developing such buildings. The framework includes a risk assessment process that identifies the potential impacts of natural disasters on buildings and infrastructure, and a design process that incorporates resilience into the building design process. The paper concludes with a discussion of the benefits of resilient buildings and infrastructure, and the need for continued research and development in this area.

Fast Tracking

Abstract: The design of buildings and infrastructure must take into account the increasing frequency and intensity of natural disasters, particularly earthquakes and hurricanes. This paper discusses the challenges of designing buildings that are resilient to these events and presents a framework for developing such buildings. The framework includes a risk assessment process that identifies the potential impacts of natural disasters on buildings and infrastructure, and a design process that incorporates resilience into the building design process. The paper concludes with a discussion of the benefits of resilient buildings and infrastructure, and the need for continued research and development in this area.

Key Performance Indicators of Buildings

Abstract: The design of buildings and infrastructure must take into account the increasing frequency and intensity of natural disasters, particularly earthquakes and hurricanes. This paper discusses the challenges of designing buildings that are resilient to these events and presents a framework for developing such buildings. The framework includes a risk assessment process that identifies the potential impacts of natural disasters on buildings and infrastructure, and a design process that incorporates resilience into the building design process. The paper concludes with a discussion of the benefits of resilient buildings and infrastructure, and the need for continued research and development in this area.

Design Process

Abstract: The design of buildings and infrastructure must take into account the increasing frequency and intensity of natural disasters, particularly earthquakes and hurricanes. This paper discusses the challenges of designing buildings that are resilient to these events and presents a framework for developing such buildings. The framework includes a risk assessment process that identifies the potential impacts of natural disasters on buildings and infrastructure, and a design process that incorporates resilience into the building design process. The paper concludes with a discussion of the benefits of resilient buildings and infrastructure, and the need for continued research and development in this area.

Cross-Display Object Movement In Multi-Display Environment
Miguel A. Nacenta - University of Saskatchewan - Canada

Motivation
Multi-Display Environments (MDEs) are now found everywhere and new MDEs are being developed.

Goal
Improving the usability of the design space of cross-display object movement interaction technologies.

Design Space Analysis

Problems
As we add more displays to a system, the design space of cross-display object movement interaction technologies grows. This can result in too many design options for a user to manage.

Windows

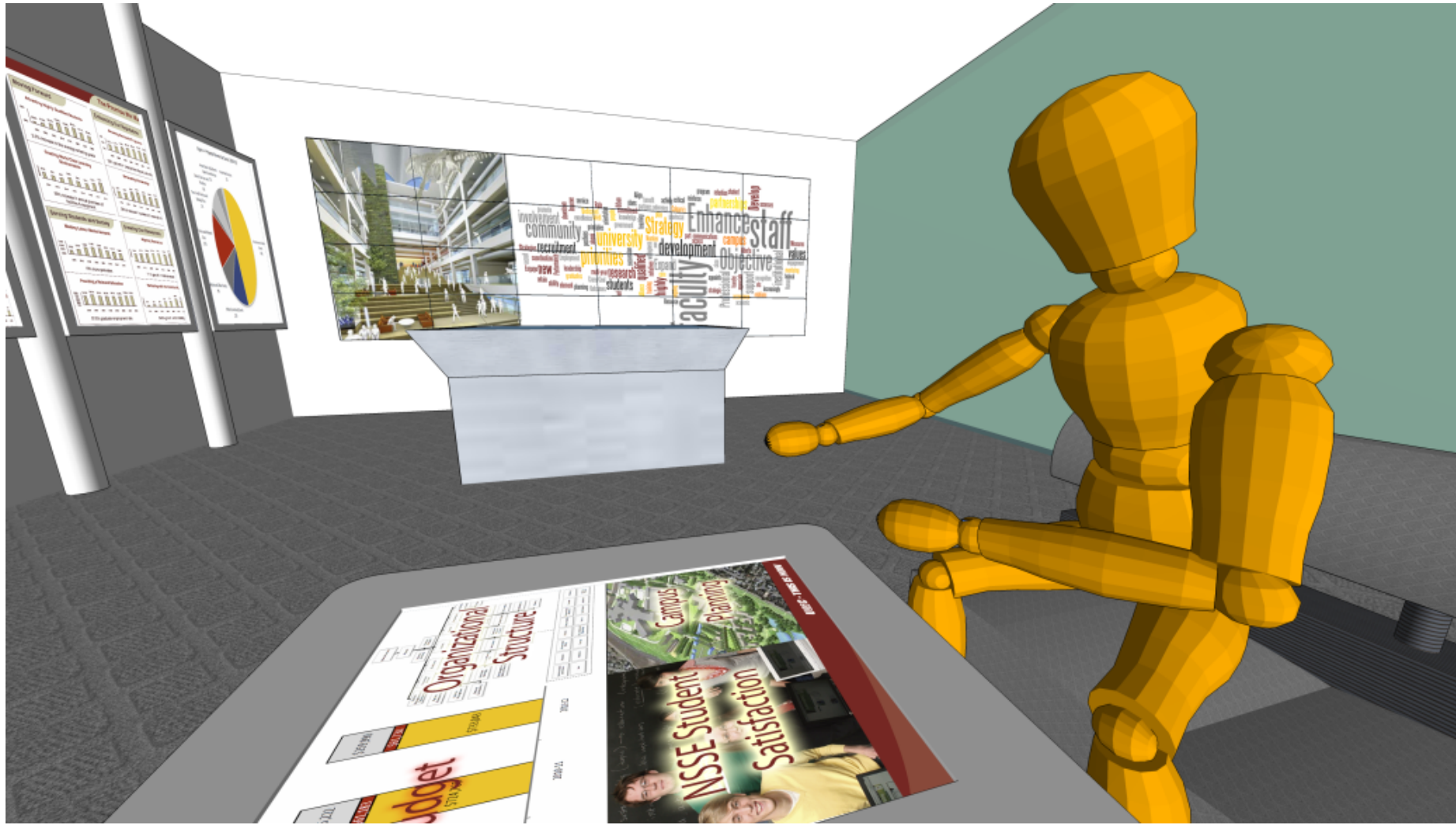
Referential Domain
How are objects related to each other?

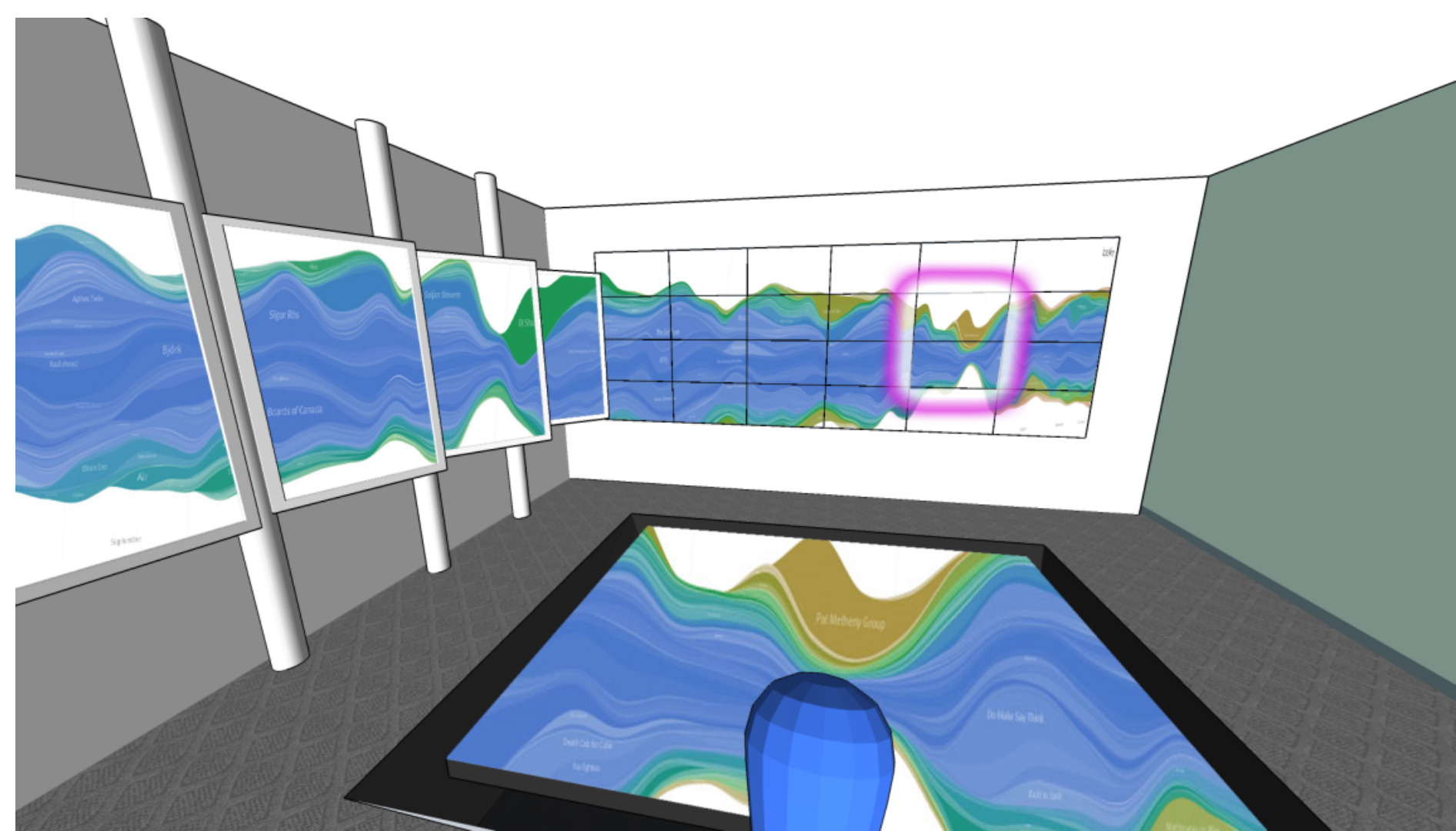
Display Configuration
How do systems and users understand each other?

Conclusion
Is it needed?

Doctoral Symposium





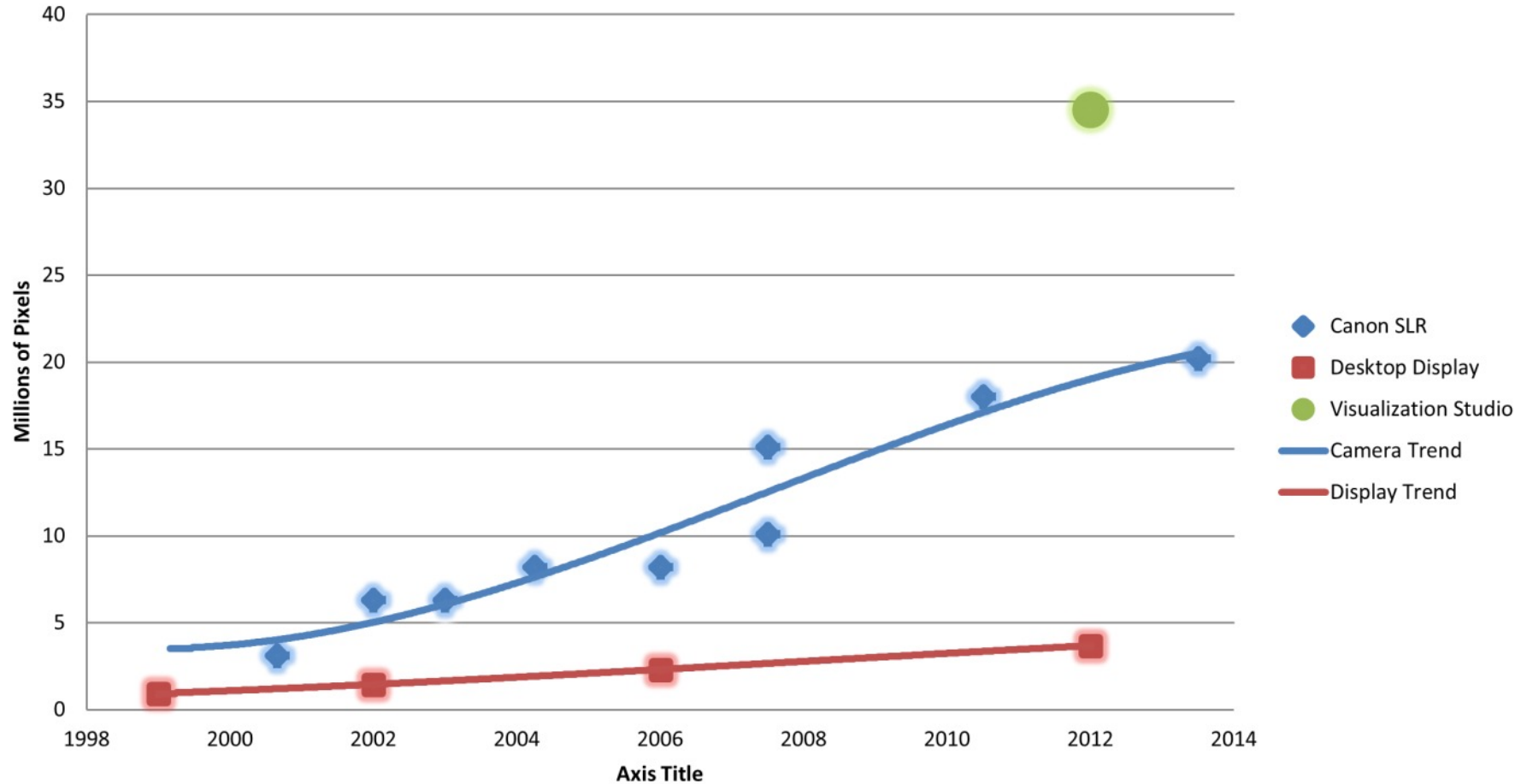






34.5 million pixels
16' X 6'

Megapixel Comparison



Canon data from Wikipedia



15 projectors
Color & brightness balanced
Small bezels (1mm)





7.1 Surround Sound





55" Touch Table
SMART

Tech Specs

- 34.5 million pixels
(9600 X 3600)
- 16' X 6'
- Windows OS
- Dual Xeon E5-2687 3.1 GHz
Processors w/ 96 GB RAM
- 4 NVidia Quadro K5000
graphics cards
- 55" LCD HD Touch Table
- 27" All-in-One PC –
Presentation Console
- 7.1 Surround Sound
- 5 DVI + 5 VGA video inputs
- 1mm bezels
- Christie Entero DLP Projectors
– 60,000 hr bulb life

Hiring the Manager

What we needed as per committee...

Technical

- Programming languages, C ++, C Sharp and Java
- Graphics programming libraries and/or frameworks
- Hardware experience, large display environments

People Skills

- Experience working in team environments
- Presentation skills
- Some evidence of self-motivation
- Leadership

Hiring the Manager

What we asked for on the job description...

Qualifications/Expertise Required:

Education:

A minimum of a Masters degree in Computer Science or other relevant masters degree is required. Ideally, education will reflect a combination of technology and visualization courses.

Required Experience:

Five to ten years of experience related to technical support and visualization is required.

Strong leadership skills and the ability to exercise responsibility over a physical area and the equipment within it.

Desired Experience:

Ability to balance priorities and workloads, working both independently and collaboratively

Strong verbal, written and presentation skills

Extensive customer service and troubleshooting skills

Previous experience with budget preparation and grant proposals

Must have the capability to successfully manage multiple competing priorities with minimal supervision and direction

Technical Skills:

PC Support

Experience with Windows OS, PC hardware, troubleshooting in a PC environment and providing public support in a PC environment

Visualization Software Support

Experienced at supporting research-level use of visualization software.

Visualization Support

Superior knowledge of visualizations in various forms and extensive knowledge and participation in visualization communities.

Hiring the Manager

Who we hired...



John Brosz, Ph.D. Computer Science

Background in Data Visualization & 3D Graphics

Hiring the Manager

Why researchers value John...



1. Ph.D.
2. Has conducted research himself
3. Has published work
4. Computer Science background, comfortable tackling difficult issues
5. Approachable & accessible
6. Cares and is interested in the research brought to the Studio



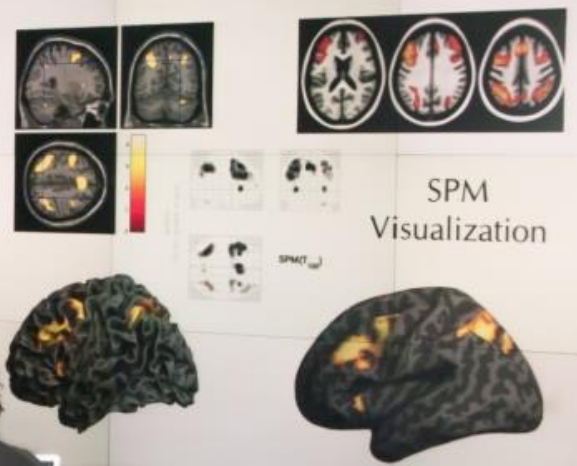
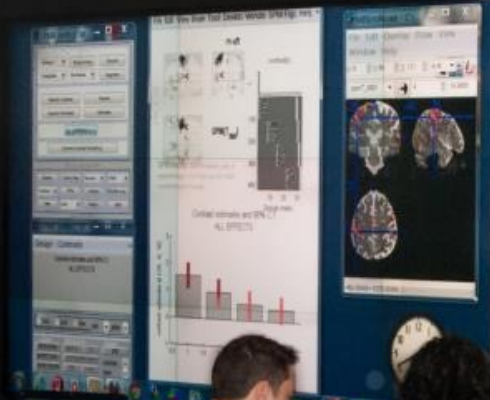
Uta Hinrichs & Prof. Sheelagh Carpendale



ASE Lab (Prof. Frank Maurer) & Industry Partner C4i



SPM
Visualization



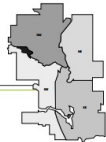
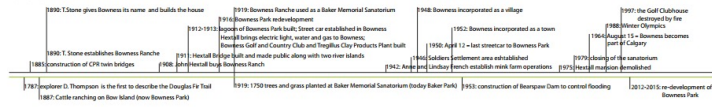


Dan Perry, Photography by Dave Brown



Frank Maurer, Chris Burns, Daniel Sabourin, Patrick King, & Teddy Seyed
ASE Lab <http://ase.cpsc.ucalgary.ca>

HISTORICAL TIMELINE



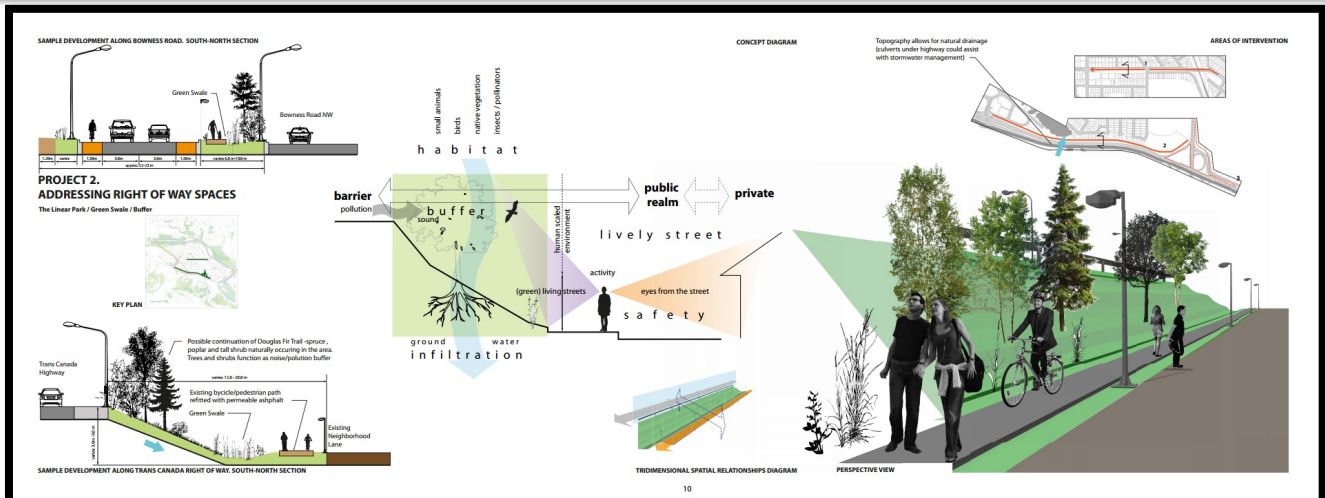
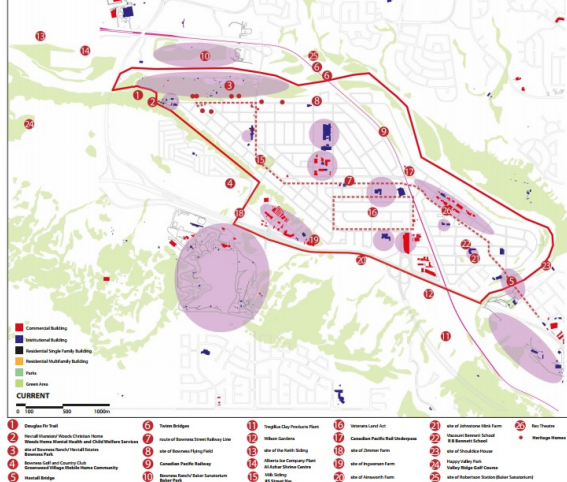
CASE STUDY. HISTORICAL ANALYSIS



HISTORICAL EVOLUTION OF BOWNESS. FIGURE GROUND AND GREEN/NATURAL COVER

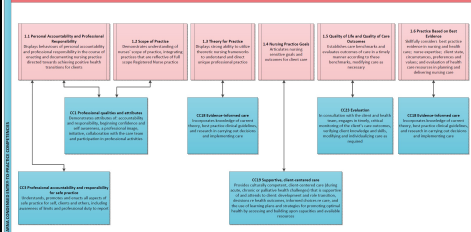


BOWNESS HISTORICAL LANDMARKS AND COMMUNITY HERITAGE

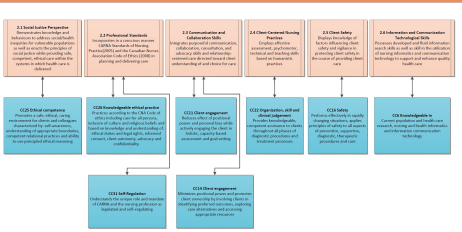


UNIVERSITY OF CALGARY BSNAR CURRICULAR THEMES & PROGRAM LEARNER OUTCOMES

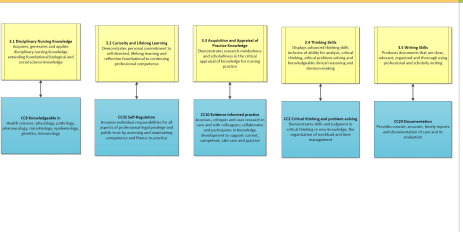
5. Nursing as a Practice Discipline
Nursing as a practice discipline has a unique culture, work, goals, and values that distinguish it as a primary in providing, maintaining, supporting and restoring health, living systems, promoting health and preventing health risks. It is the responsibility of the nursing curriculum to ensure that the student is prepared to meet the needs of the practice discipline.



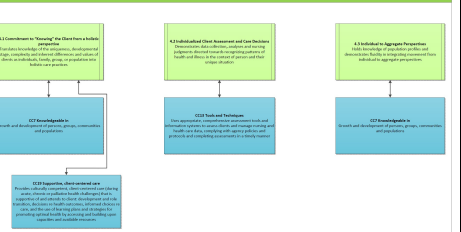
2. Student as Professional
Students are prepared for the discipline and profession of nursing as well as contribution to a socially/ethical justice perspective and by way of this education program, develop personal skills, dispositions, and competencies to meet the standards of professional practice.



3. Nursing as a Scholarly Activity
Skills of scholarship, inquiry, analysis, critical thinking and research embedded in care of a client/patient. Long term changes to be made in the health of a society and, therefore, form essential foundations in the education of the student in this program.

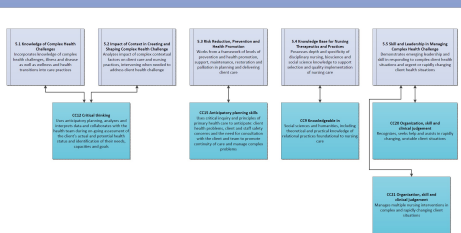


6. Knowing the Client
The curriculum acknowledges that complexity of the client, where there are multiple of cultures, ethnic, health status, goals and context will be complexity of health challenges, whether in achieving solutions or dealing with illness, each unique health situation and a true patient/client experience.

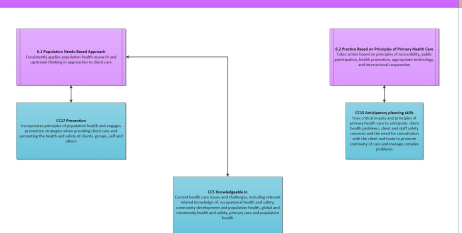


UNIVERSITY OF CALGARY

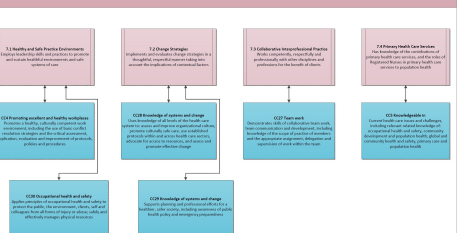
3. Understanding and Managing Complex Health Challenges
The clients of nursing are faced with health challenges that require a multifaceted approach to address them. Health challenges are complex and affective by themselves or by themselves of many factors across the lifespan. These challenges can be complex and affective by themselves or by themselves of many factors across the lifespan. These challenges can be complex and affective by themselves or by themselves of many factors across the lifespan.



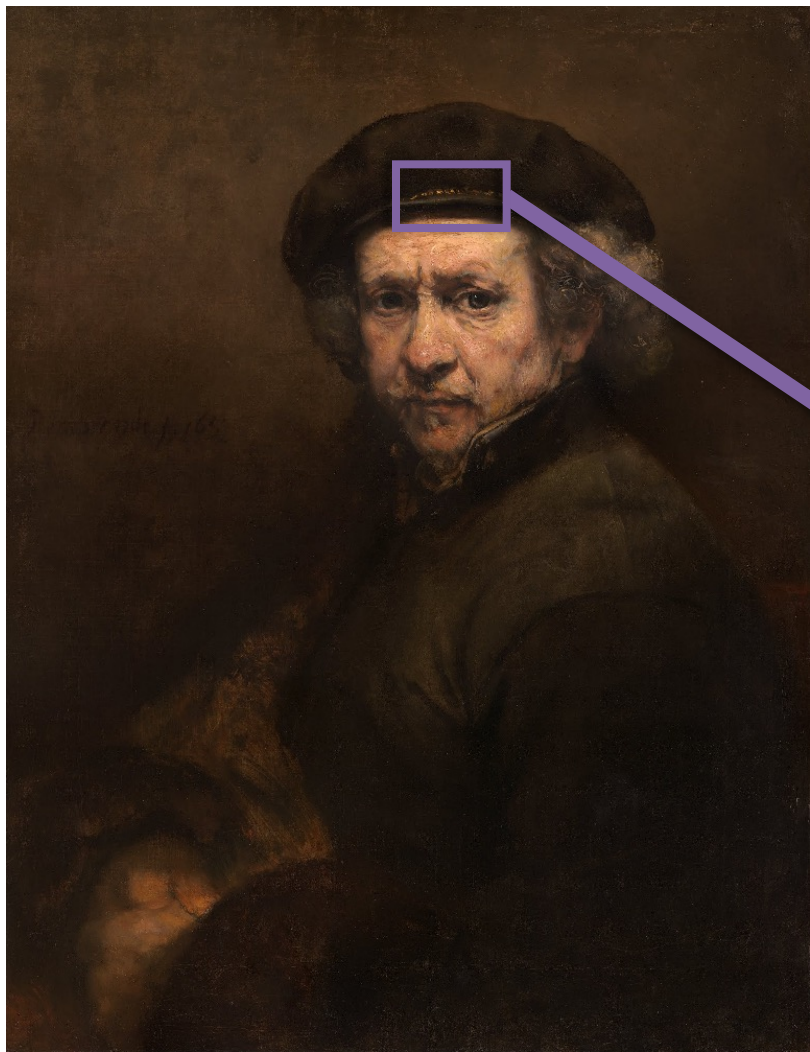
6. Health, Health Promotion, Wellness/Disease and Primary Health Care
The broad context of population health, primary health care, health promotion and primary prevention are core as the means to make meaningful difference or improve health of clients of nursing and improve health and wellness of a society.



7. Leadership and Systems of Care
Students are knowledgeable covering the role health system design that is a determinant of health. It is recognized that foundational health care is based on health care that emphasizes safety and knowledge of factors and practices that protect client safety/quality care is a core to emerge from practice learning that emphasize collaborative practice models and interdisciplinary learning. Agreed to care and prepared to act, in the leadership role of clinical practice.









murals@crwalpole.com

C.R. Magrath 2012

Prof. Murray McGillivray, Kelsey Moskall, & Jaclyn Carter

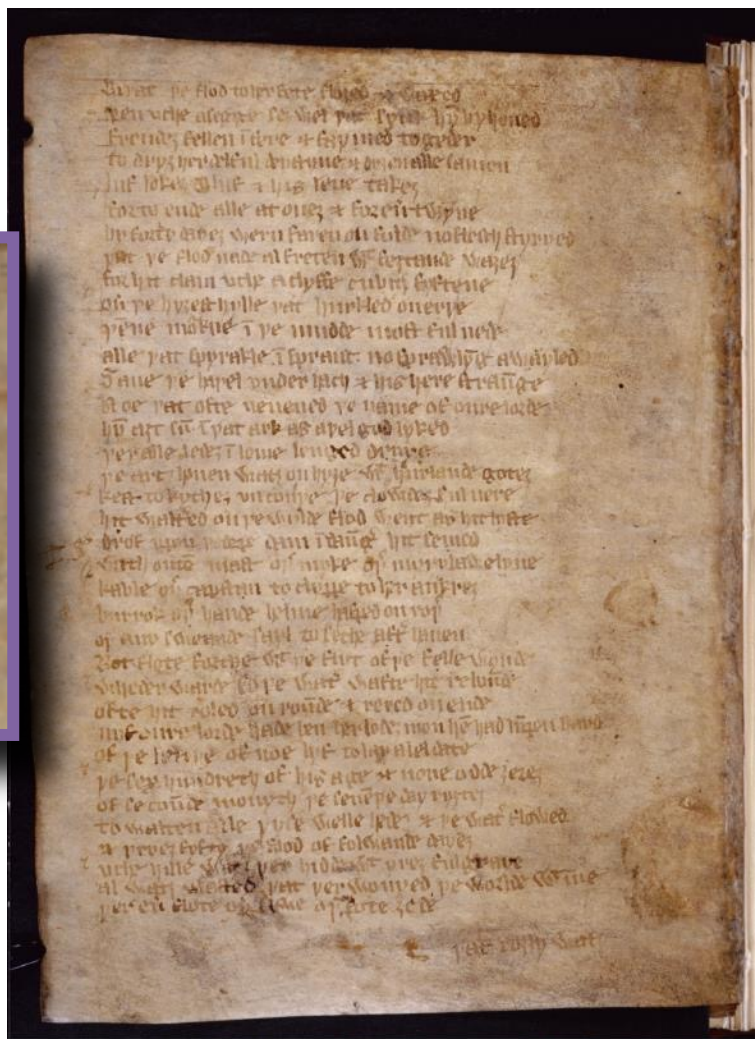
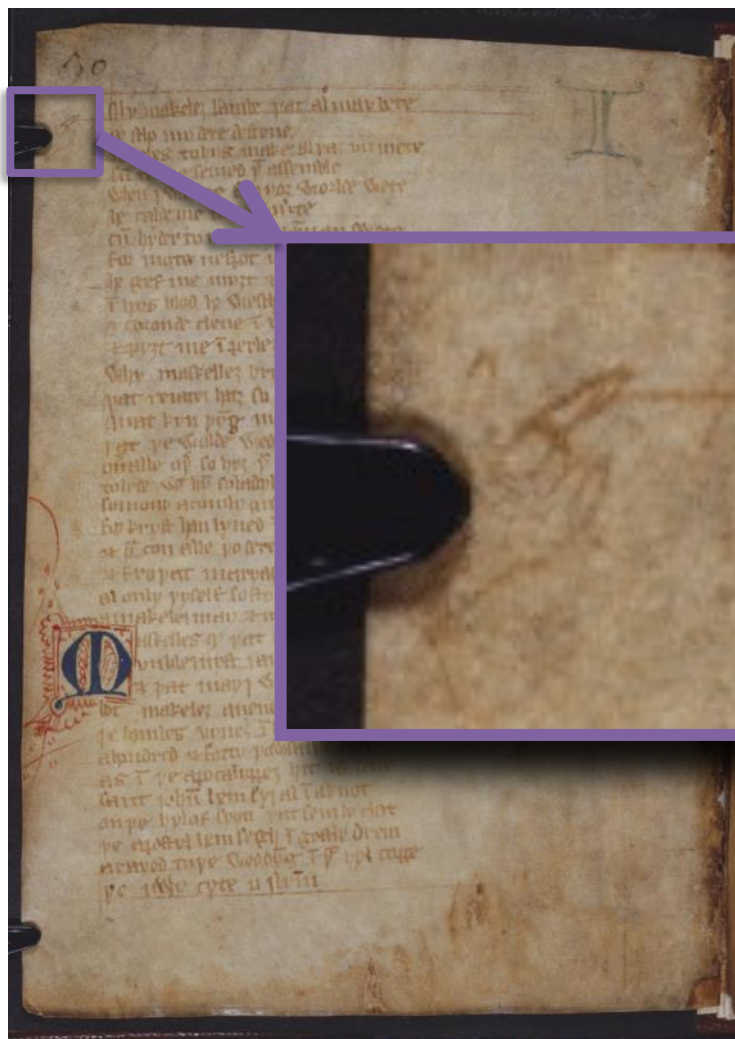
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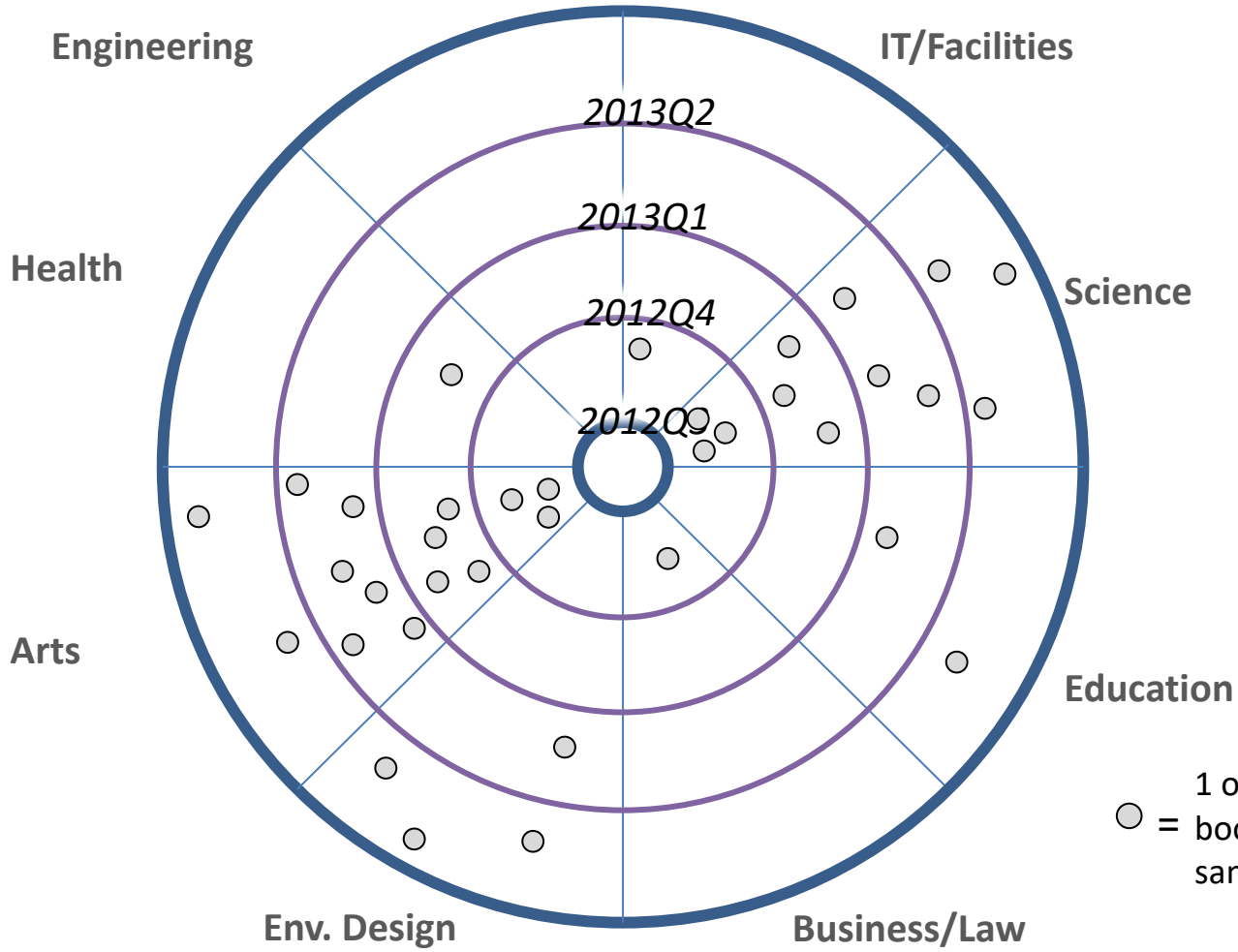
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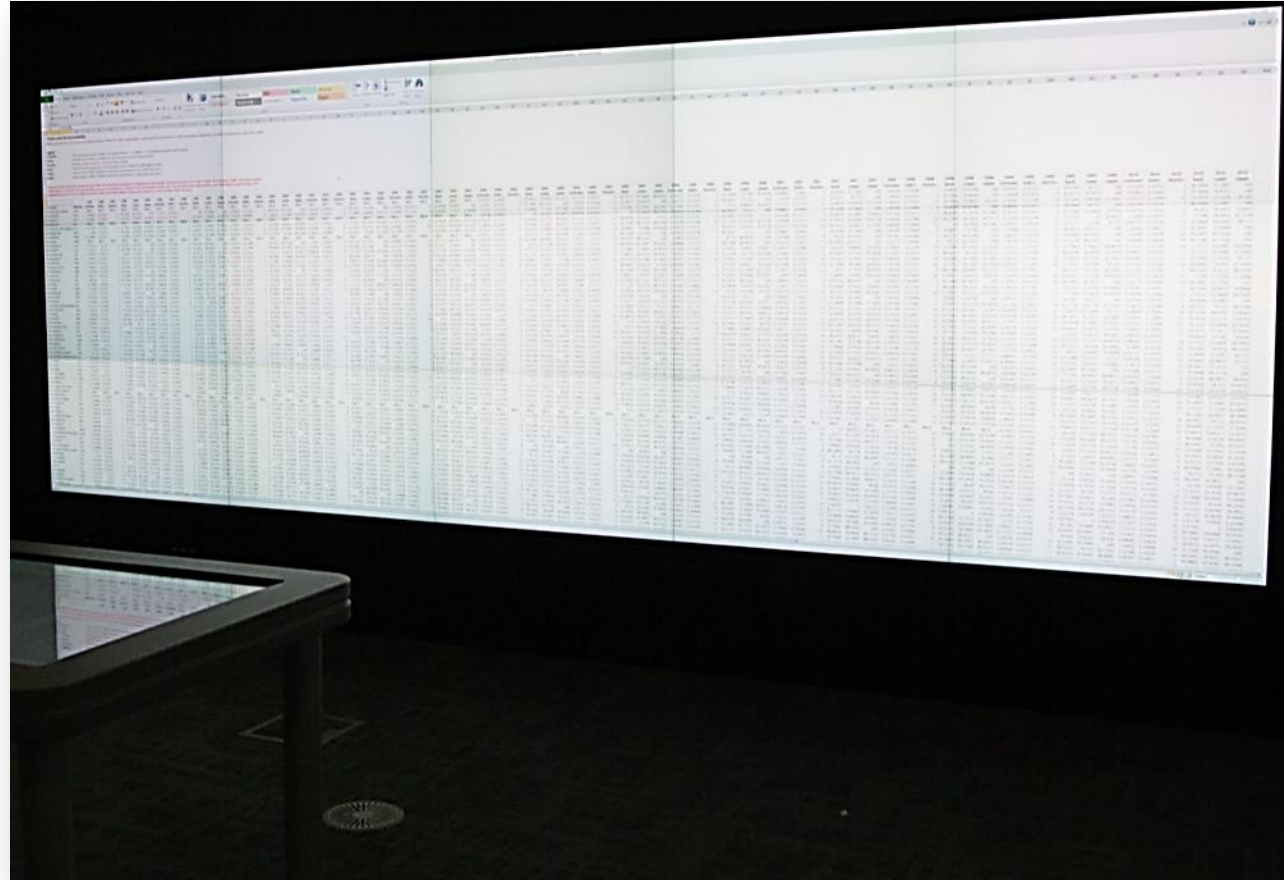




○ = 1 or more bookings by the same person.

Software Used in the Visualization Studio

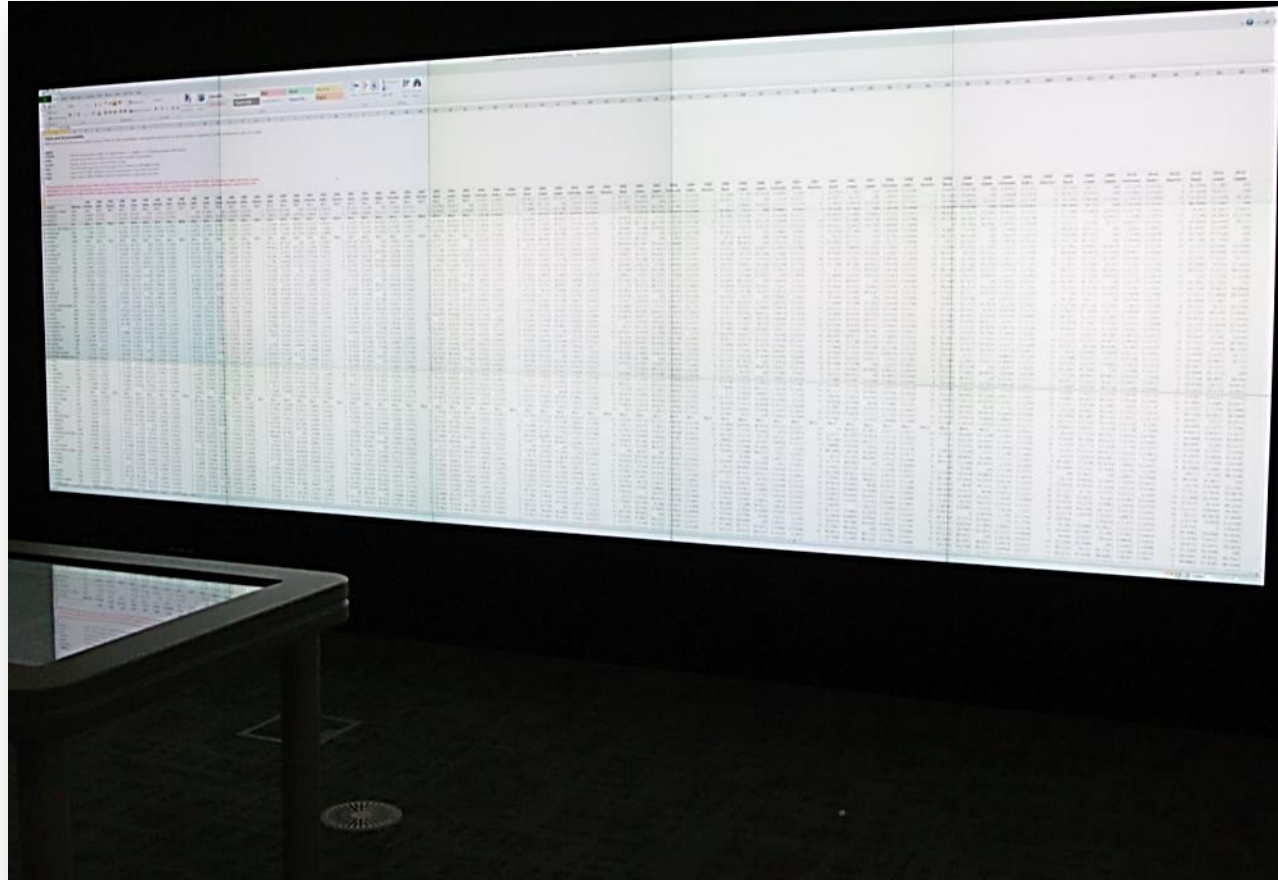
- SPSS
- NVivo
- Stata
- ArcGIS
- MATLAB
- Mathematica
- Tableau
- AutoCAD
- 3DSMax



Hardware Upgrade

Original PC good at running multiple applications, particularly multiple real-time applications

A year after the studio opened a PC became available to render 3D images on the large screen



Valuable Characteristics

Visualization Studio

- Politically neutral position on campus
- Collaborative Workspace
- No windows, protect privacy of data
- High Resolution
- Lots of digital Real-Estate
- Wall looks great in P.R. photos & video
- Flexible furniture available to arrange the room in various configurations
- Open to new uses of the space



Valuable Policies

Visualization Studio

- Allow food & drink, encourage catered events in the space
- Restricted to Faculty & Graduate Students (no undergrads)
- Can reserve the studio a maximum of 7 consecutive days
- Access the studio when the library is open (7am to 11pm, 7 days a week)
- Card access to specific researchers



Evaluating Usage

Standard Measures
Post-use questionnaire

Count:

Bookings

Tours

Faculty

Students

Research areas

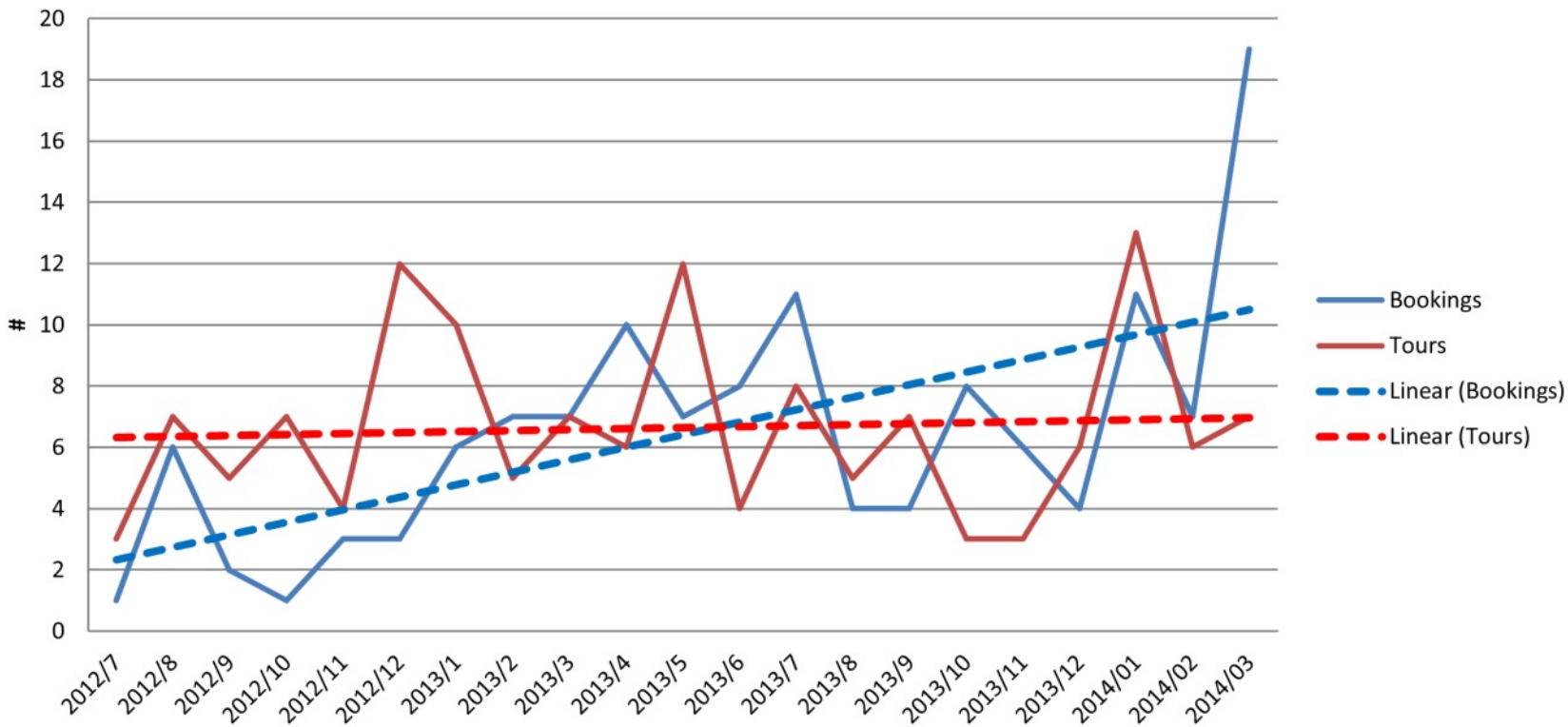
Publications

Days in use

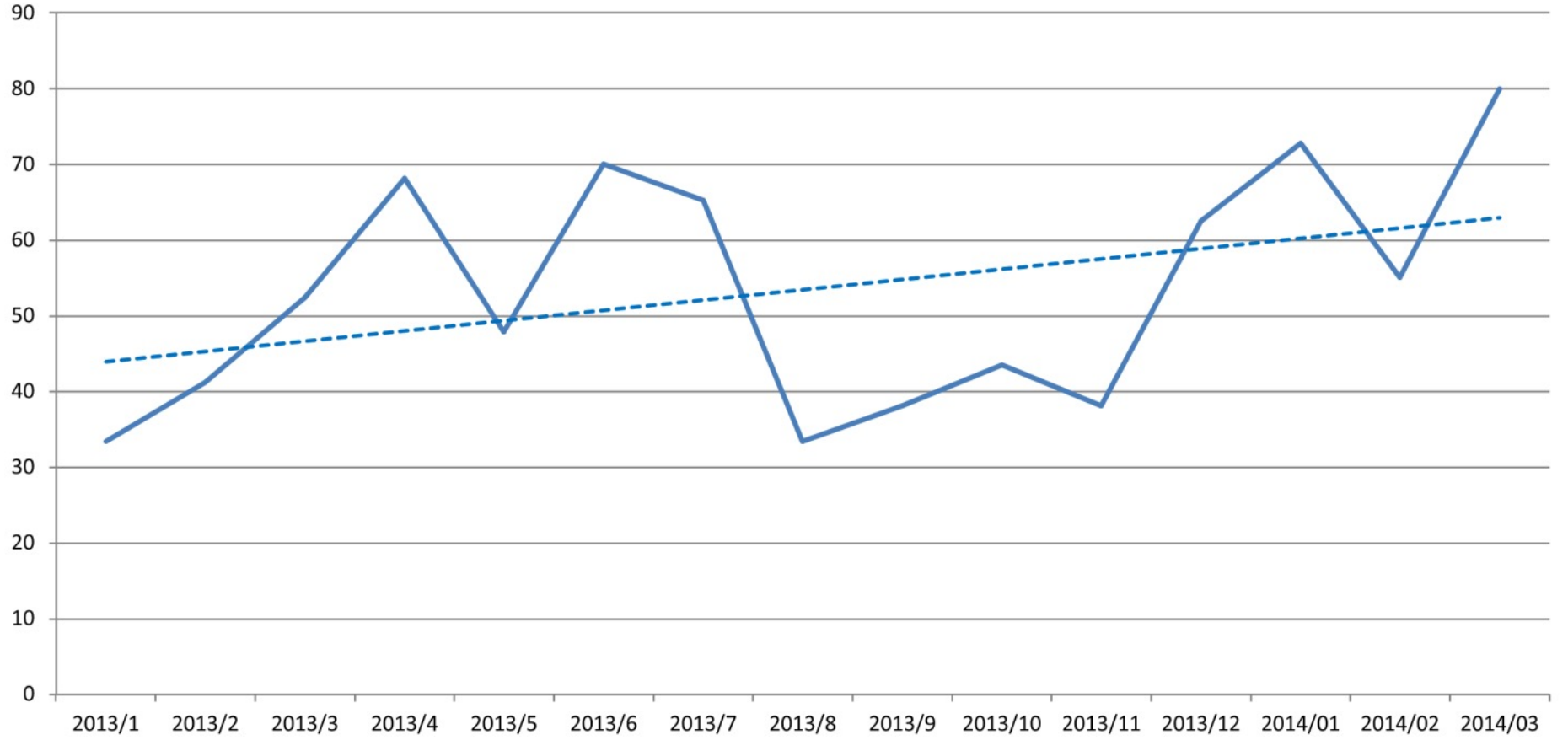
Available to researchers,
July 2012

Evaluating Usage

Bookings & Tours Per Month



% Weekdays in Use



Lessons Learned

Staff

1. Research Coordinator (John)
2. Technical assistance to assist John when needed
3. Marketing, promotions, event planning
4. Library administrator to liaise with campus researchers



Lessons Learned

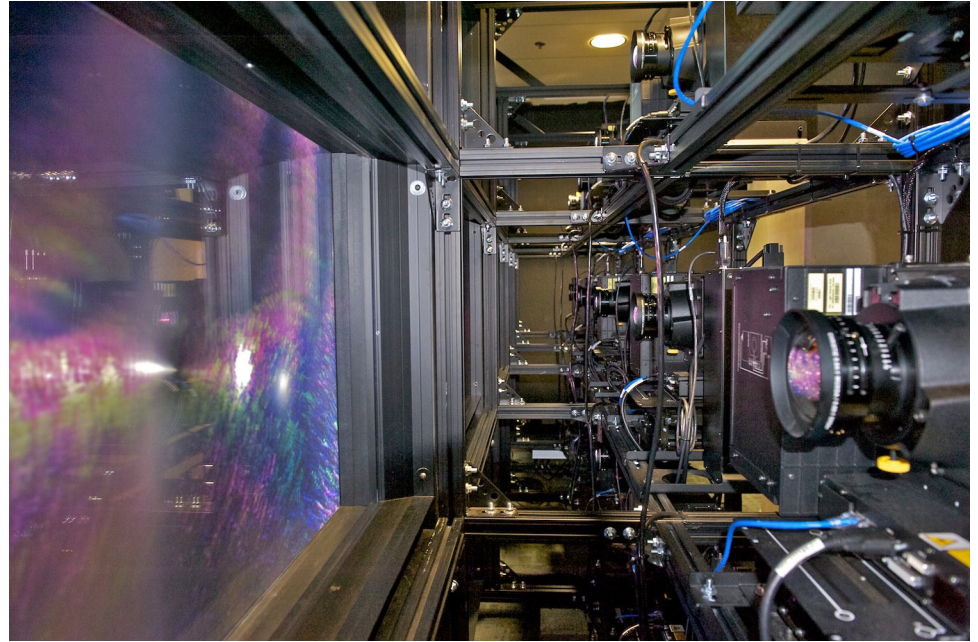
Another room or a moveable wall

- A smaller more intimate space
- A larger space for teaching and big events



Lessons Learned

Vendor shootout



Thanks

library.ucalgary.ca/visualizationstudio



Shawna Sadler

AUL, Digital Library &
Research Technologies
ssadler@ucalgary.ca



John Brosz

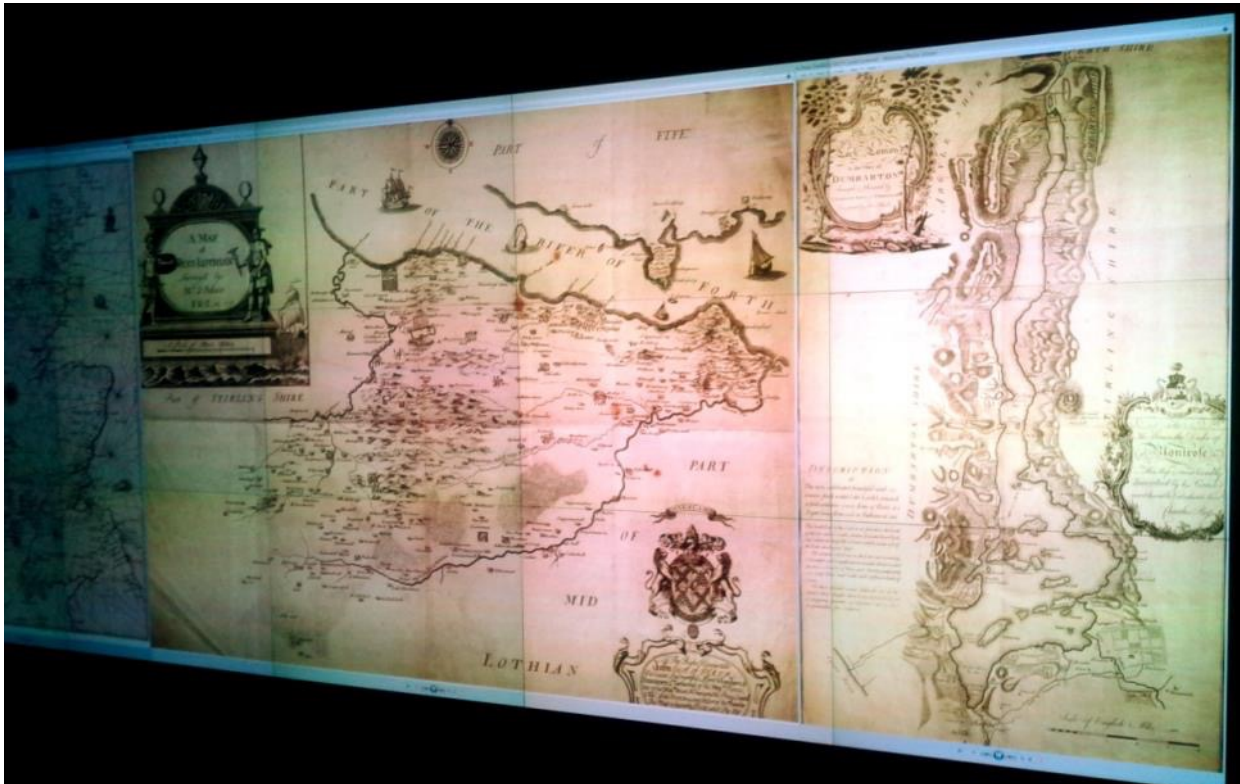
Visualization Research Coordinator
jdlbrosz@ucalgary.ca
403-220-5247

Extra Slides

Visualization Studio



Visualization Studio



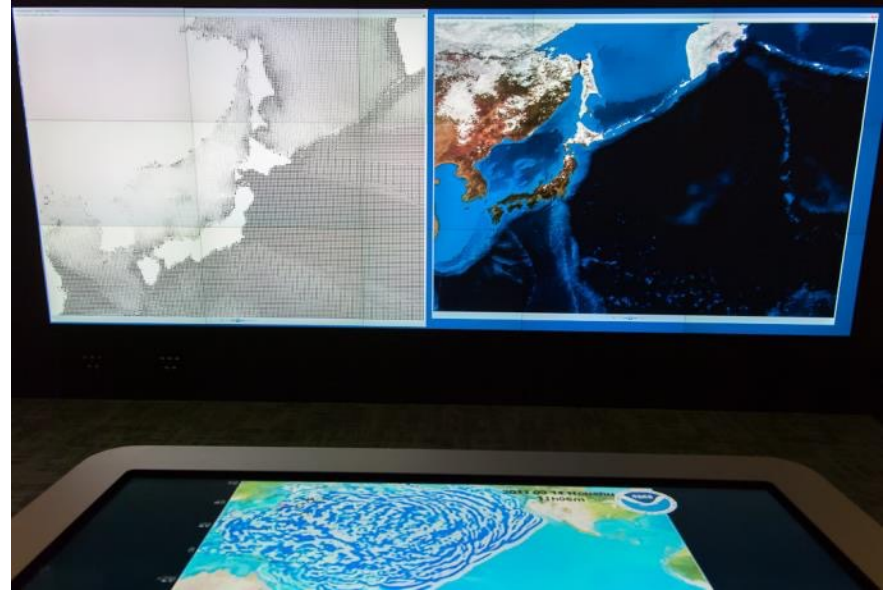
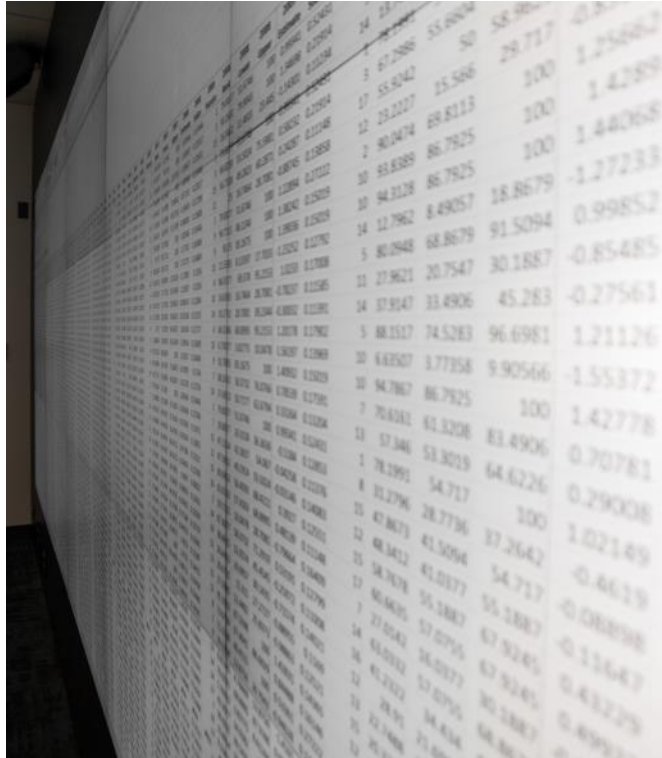
Visualization Studio



Visualization Studio



Visualization Studio



Visualization Studio

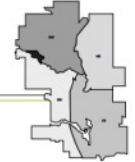
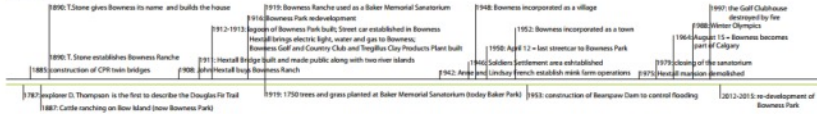


2. Image Analysis

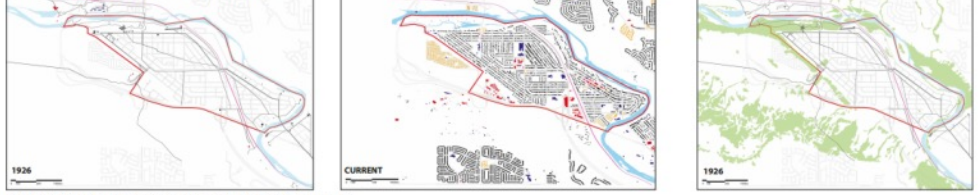


Image from
http://eamonokane.com/work/4_ideal_collection

HISTORICAL TIMELINE



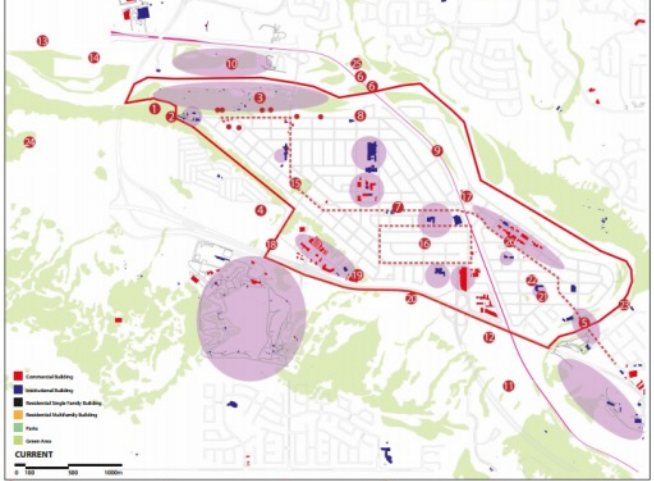
CASE STUDY. HISTORICAL ANALYSIS



HISTORICAL EVOLUTION OF BOWNESS. FIGURE GROUND AND GREEN/NATURAL COVER



BOWNESS HISTORICAL LANDMARKS AND COMMUNITY HERITAGE

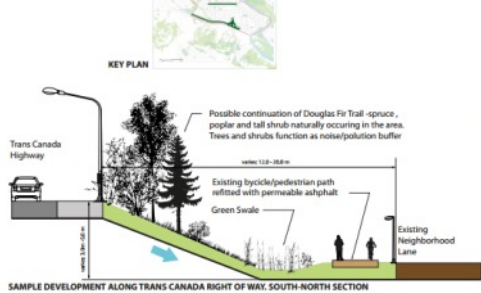


- 1 Douglas Fir Trail
- 2 Howell Mansion (Winn, Christie House)
- 3 Bowness House (Winn, Christie House)
- 4 Bowness House (Winn, Christie House)
- 5 Howell Bridge
- 6 Tuben Bridges
- 7 Home of Bowness Street Railway Line
- 8 Site of Bowness Ferry (Herald Steamer)
- 9 Bowness Golf and Country Club (Historical Park)
- 10 Bowness City Products Plant
- 11 Wilson Gardens
- 12 Site of the South Biding
- 13 Bowness Golf and Country Club (Historical Steamer)
- 14 Bowness City Products Plant
- 15 Site of Bowness Ferry
- 16 Site of Bowness Ferry
- 17 Site of Bowness Ferry
- 18 Site of Bowness Ferry
- 19 Site of Bowness Ferry
- 20 Site of Bowness Ferry
- 21 Site of Bowness Ferry
- 22 Site of Bowness Ferry
- 23 Site of Bowness Ferry
- 24 Site of Bowness Ferry
- 25 Site of Bowness Ferry
- 26 Site of Bowness Ferry

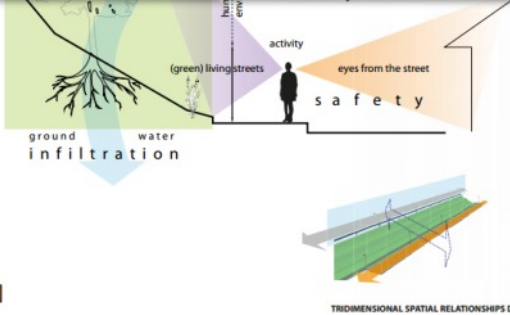
AREAS OF INTERVENTION



KEY PLAN



SAMPLE DEVELOPMENT ALONG TRANS CANADA RIGHT OF WAY. SOUTH-NORTH SECTION



TRIDIMENSIONAL SPATIAL RELATIONSHIPS DIAGRAM



PERSPECTIVE VIEW

UNIVERSITY OF CALGARY BSN CURRICULAR THEMES & PROGRAM LEARNER OUTCOMES

