XIM

A4815 - XIM: Parametric Site Analysis

**Instructor: Luc Wilson**
Thursdays, 6-8pm, 202 Fayerweather

Summary:

This course will examine the maturity of the 21st century metropolis by moving past conventional benchmarks and preconceptions of growth to develop flexible design systems founded on a holistic approach to economic, environmental, and social problems that will allow for speculation on many possible futures for the city. Using this methodology, termed X-Information Modeling or XIM, students will leverage parametric design tools to create systems that strategically integrate diverse objectives, and through Grasshopper for Rhino, visualize potential scenarios for a more informed decision making process.

Students will select a site and program, reverse engineering key relationships influencing design and development, such as zoning, real estate value, and the environment, in order to 1) find new relationships between traditionally separate or competing objectives, 2) to visualize speculative futures of the site, and 3) reposition and reorganize those relationships through a visualized evaluation process that challenges design and development preconceptions. Through this process students will be asked to create new drawing types (static and animate) that can effectively communicate the intent of their parametric design systems for evaluation and critique.

Students will learn new tools (Grasshopper, Howl, Excel, Google Earth, Galapagos, etc.), how to evaluate and use data, how to visualize metrics, and, most importantly, how to define and translate simple concepts into powerful parametric relationships. Students should know Rhino. Grasshopper proficiency is not required, but a basic understand is recommended. Session A is required for Session B, however Session A can be taken with out Session B. Grading for each session will be 30% for attendance and weekly assignments, and 70% for the final project.

Muchan Park and Luc Wilson developed X-Information Modeling and the content of this course.
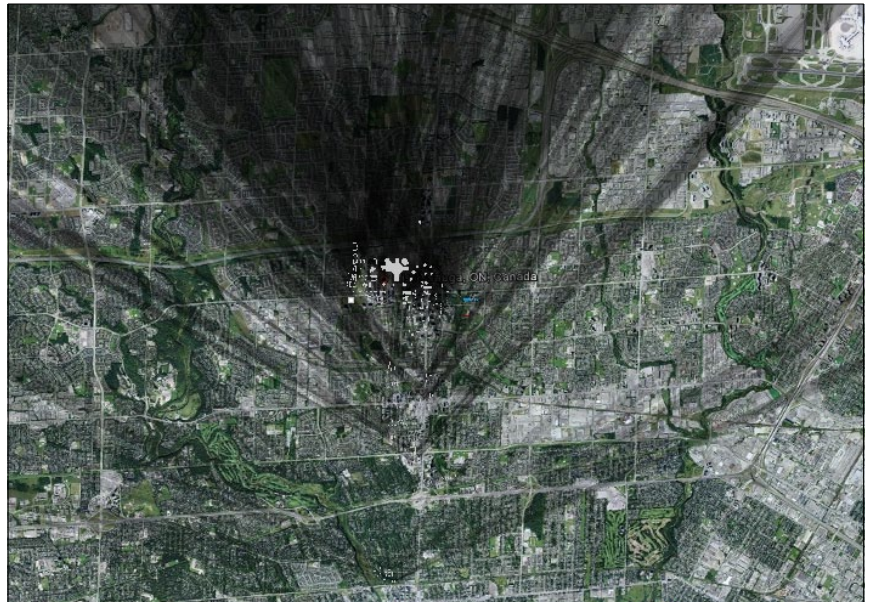

View Analysis
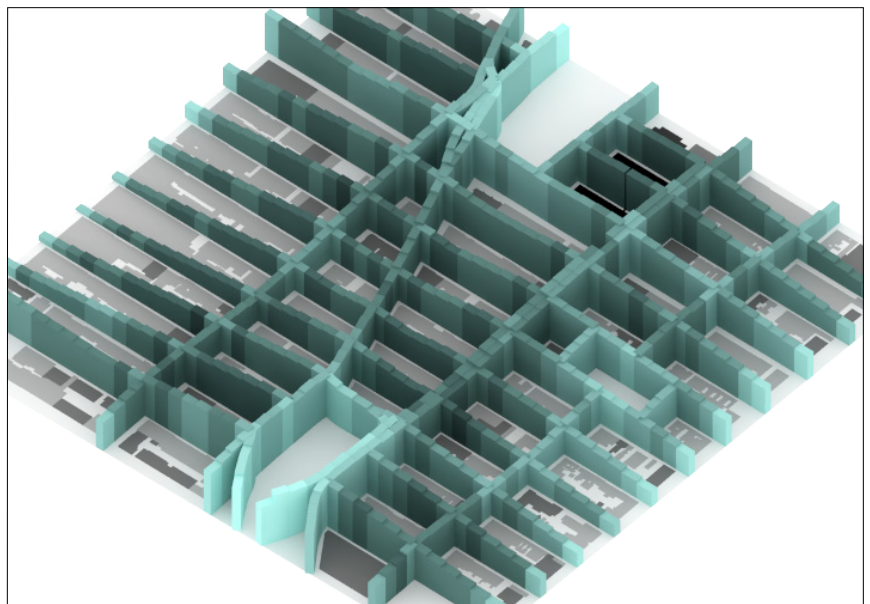
Visualization of walkability, sky exposure, and FAR near Union Square, NY

Session A - Parametric Site Analysis

Session A will be research oriented, with students focused on creating and developing a unique evaluation tool for understanding the performance and trends of their site and program. Students will collect data, determine which metrics are most relevant, and analyze their site by introducing various speculative scenarios. Session A will introduce the following grasshopper topics: data management, proximity based evaluation, GIS to Grasshopper, animation, and representation. Concepts covered: metrics, quantitative vs qualitative, value, evaluation methodologies, and data based decision making.

The evaluation tools created in session A will be used for optimizing the parametric massing created in session B.
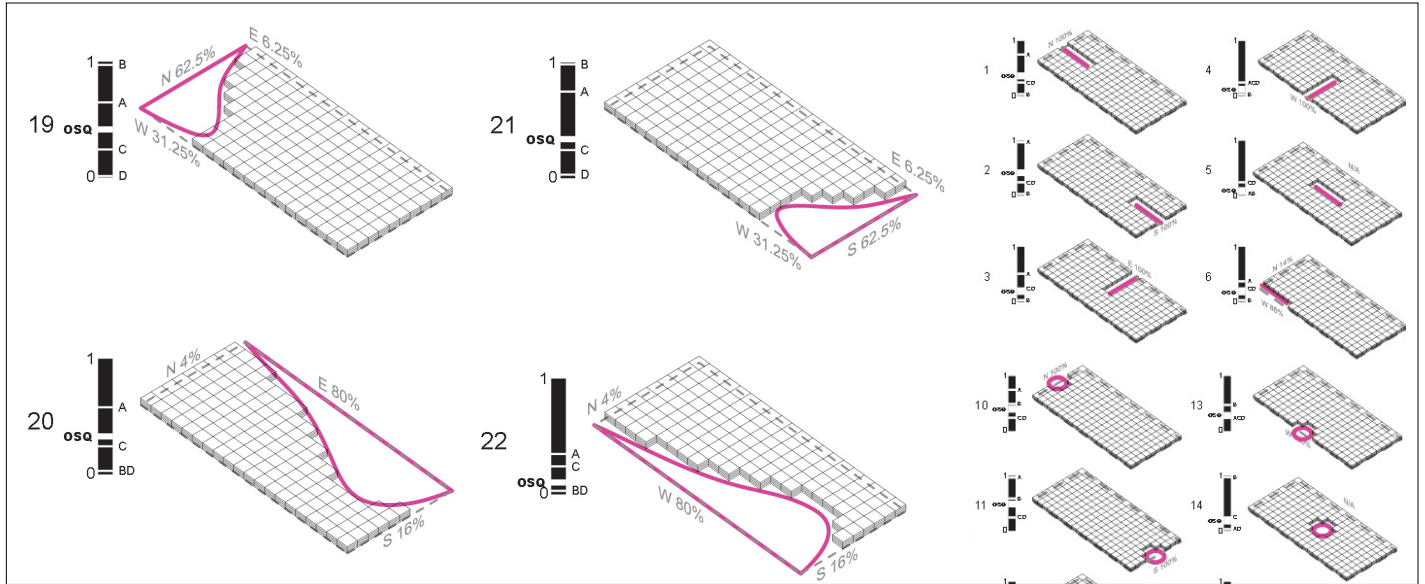
Open Space Evaluation. Christine Nasir

Parametric Site Analysis

Week 1 - : January 24th

Class Presentation:
"Introduction to X - Information Modeling."
- XIM thinking, structure, and process
- XIM Case Studies

Class Demonstration:
- Intro to grasshopper
- Create a basic massing with subdivision
- Orientation + Conditional Dispatch
- Intersections
- Shadow Casting

Assignment:
- Get a 3D model of your site, and apply at least two basic evaluation evaluation techniques covered in class to your site (at least 1/2 mile square area).

- Write a brief (100 words maximum) description of the custom evaluation tool(s) that you want to build throughout the course. Think about metrics that are competing, that relate to public space (or the public good), and that relate to your building (s).

- Output shape and data GIS files of your site for the next class. If GIS data is not available, try and find another source of data that is relevant to your site. For example, it could be census data, energy performance by building types, or even collected by walking (or google street viewing) your site and taking notes. In the next class we will go over how to link data to grasshopper via excel.

- In preparation for class do video tutorials for "matching GIS to Grasshopper," "attractor," "proximity based evaluation," and review video tutorials on techniques cover in class as necessary. Video tutorials are posted on courseworks in "Files & Resources" -> "Week 2"

Saturday Help Session:
Optional: 202 Fayerweather, time TBD

Custom Evaluation Tool. John Barrett

Retail Access Analysis
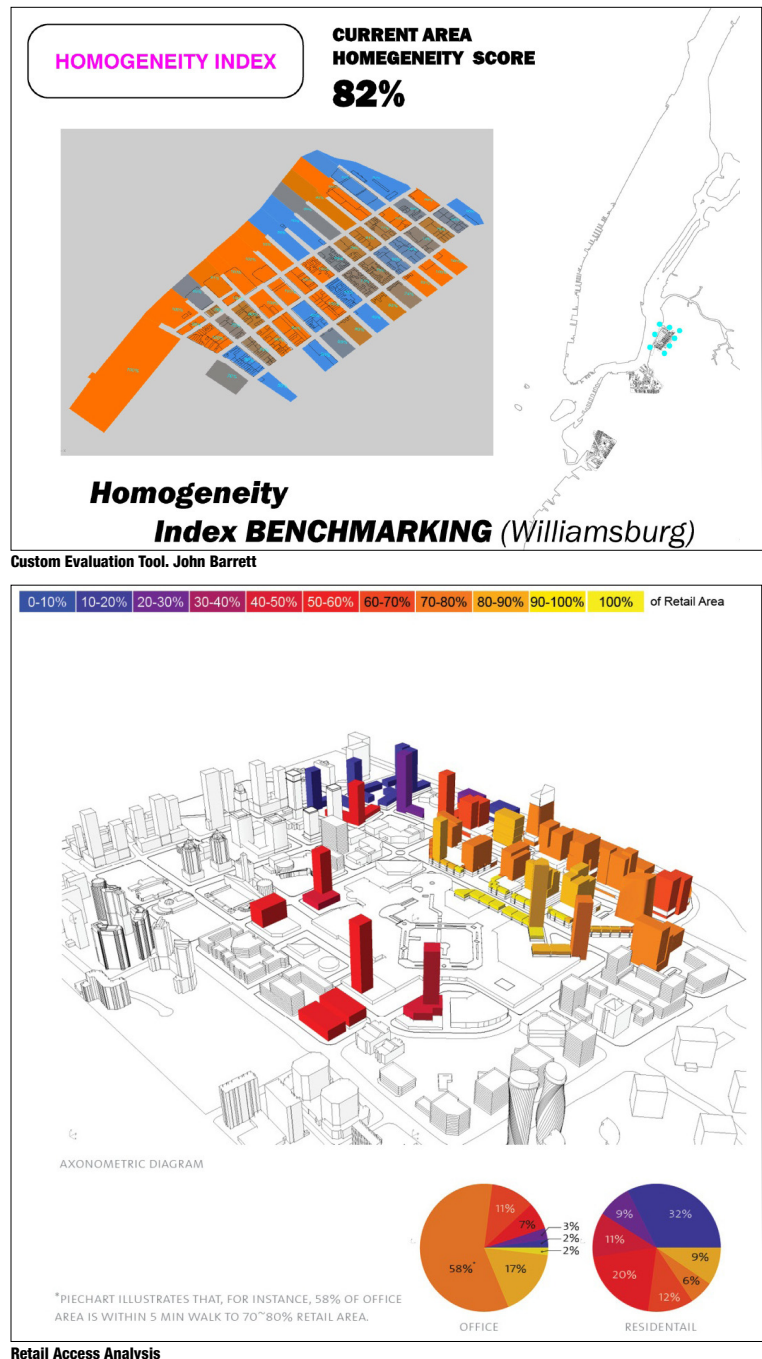
Parametric Site Analysis

Week 2 - January 31st :

Class Presentation:
"Animating for Trends" and
"Tracking Value"

Review:
Initial Evaluations.

Class Demonstration:
- Matching data (GIS) to Grasshopper via Excel.
- How to analyze and operate on the data from GIS.
- How to animate basic changes in the site or massing:
  rotating massing, non-uniform scaling, and movement.

Assignment:
- Animate a simple massing(s) moving around site,
  or change the site through animation. Based on the
  results of the animation, diagram the performative
  trends of you site.
- Do "how to normalize, weight and combine metrics"
  and "gradient" video tutorial.

Saturday Help Session:
Optional: 202 Fayerweather, time TBD
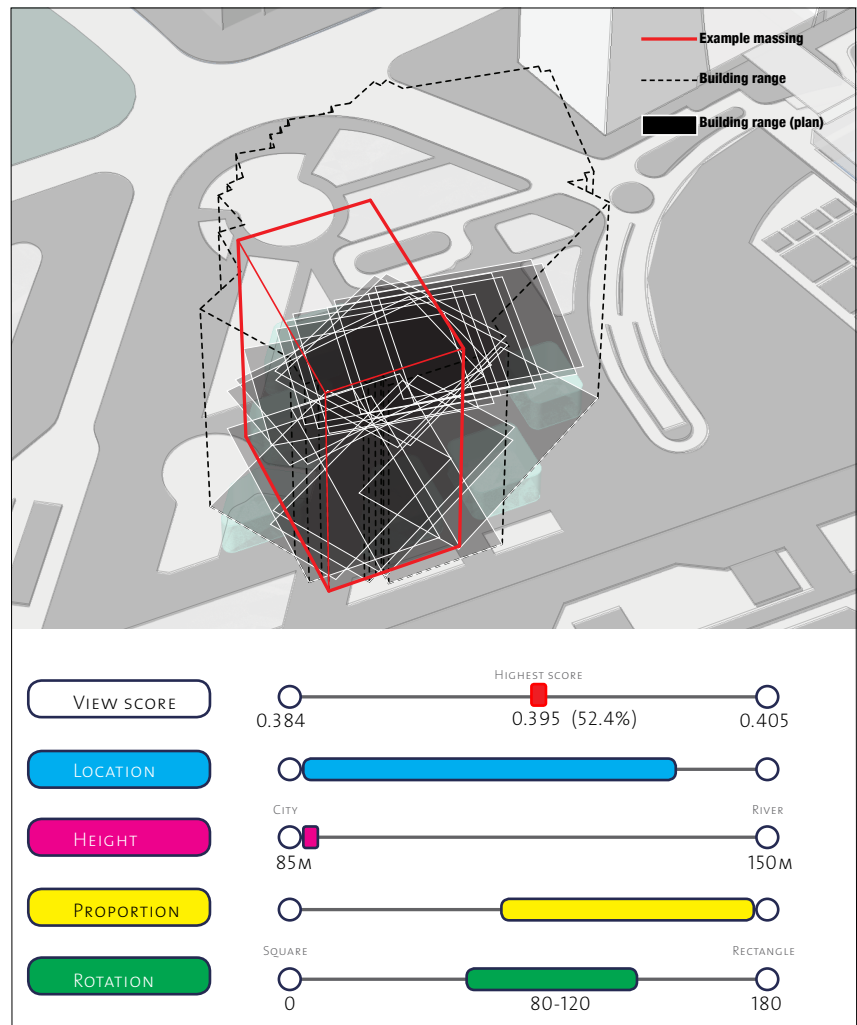
Trend Diagram illustrating the range of locations to achieve the best view

Indices and Weighting Metrics

Week 3 - February 7th :

Review:
Animated experiments and trend diagrams

Class Presentation:
"Competing Objectives"

Class Demonstration:
- Combining and weighting metrics

Assignment:
- Diagram ideas for a custom evaluation method. This can be a combination of the evaluation tools that you have
  already been exploring, and/or a proposal for new evaluation methodology. What is the biggest issue driving your
  design? Is it quantifiable and can you measure it? Or if it is qualitative, what can output would help in your decision
  making process?
- Do "how to normalize, weight, and combine metrics," "basic animation," "massing animation," and "gradient video
  tutorials." Video tutorials are posted on courseworks in "Files & Resources" -> "Week 3"

External Critique

**Week 4 - February 14th :**

Class Presentation:

TBD

Review:

Critique of student custom evaluation tools with outside experts in metrics, data, and value in order to introduce a critical balance and rigor to the evaluation tools. The critique will be both conceptual (what is the point?) and technical (how do you measure it?)

Assignment:

- Start building custom evaluation tools based on feedback from critics.

For each unit, test the percentage of the river it can see within a set radius.
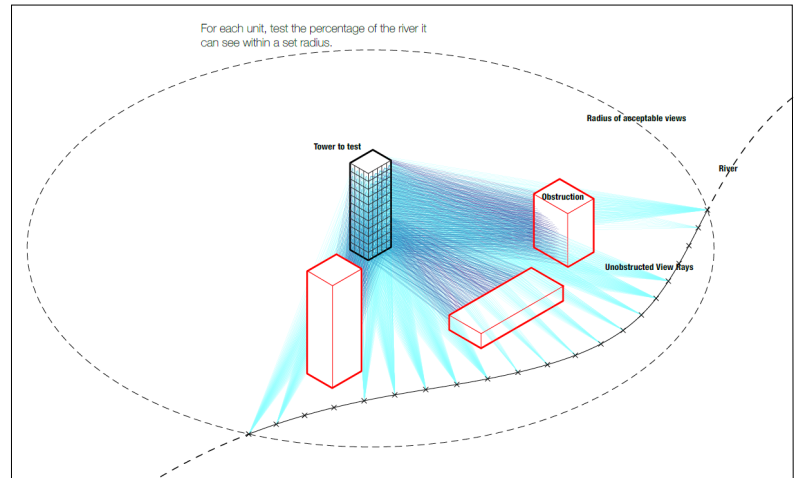
Custom View Evaluation Tool

Custom Evaluation Tool

Week 5 - February 21st :

Review:

Initial Evaluation Elements

Demonstration

- Advanced evaluation topics based on student projects.

Assignment:

- Continue working on your custom evaluation tool. Test and refine the tool by animating changes to your site.
- Do video tutorials of advanced evaluation techniques.

Custom Evaluation Tool

Week 6 - February 28th :

Review:

- Individual desk critiques on new evaluation tool.

Assignment:

- Continue working on your custom evaluation tool. Test and refine the tool by animating changes to your site.

Operational draft of evaluation tools

Week 7 - March 7th :

Review:

- Each student presents their custom evaluation tool and how it relates to the initial site analysis / benchmarking they have done.

Assignment:

- Refine custom evaluation tool in preparation for Session B

Deliverable:

- Submit rhino + grasshopper file and a pdf of your presentation.