XIM

A4815 - XIM: Parametric Site Analysis
A4829 - XIM: Parametic Massing + Optimization

Instructor: Luc Wilson
**Thursdays | 5-7pm | Ware Lounge**

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, the X-Information Modeling or XIM methodology will allow students to 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. This is achieved through the creation of a data driven 3D modeling system focused on four primary points: integration of competing objectives, visualization of data, iteration of multiple options, and ultimately, design decision making.

In teams of 2-4, students will develop a project investigating issues of density, value, and the environment. The course long project will go through four iterative cycles, two in each session. Four corresponding assignments will introduce new topics and techniques to expand the depth of the project in each cycle. We will reverse engineer key relationships influencing design and development in order to 1) find new relationships between traditionally separate or competing objectives, 2) to visualize speculative futures, and 3) reposition and reorganize those relationships through a visualized evaluation process that challenges design and development preconceptions. Through this process students are asked to create new drawing types (static and animate) that can effectively communicate the intent of their parametric design systems for evaluation and critique. The end result will be a set of custom evaluation tools and speculative typologies.

Technically, students will learn Grasshopper for Rhino and an integrated workflow that includes Excel, Google Earth, Galapagos, Ecotect, Platypus and any Geotagged Data. Additionally, we will introduce social data from sources such as flickr and twitter into the grasshopper definitions. Conceptually, students will learn 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 must know some Rhino. Grasshopper proficiency is not required, but a basic understanding will help. Grading for each session will be 30% attendance, 30% weekly assignments, and 40% for the final project.

Muchan Park and Luc Wilson developed X-Information Modeling and the content of this course.
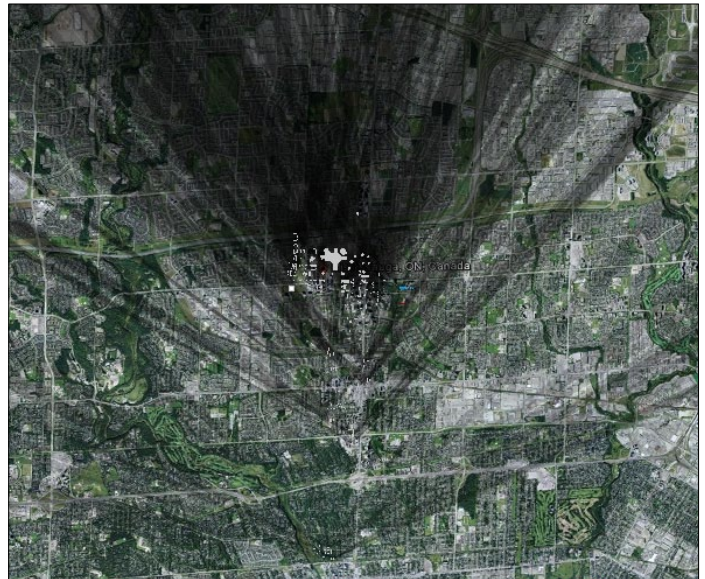
View Analysis
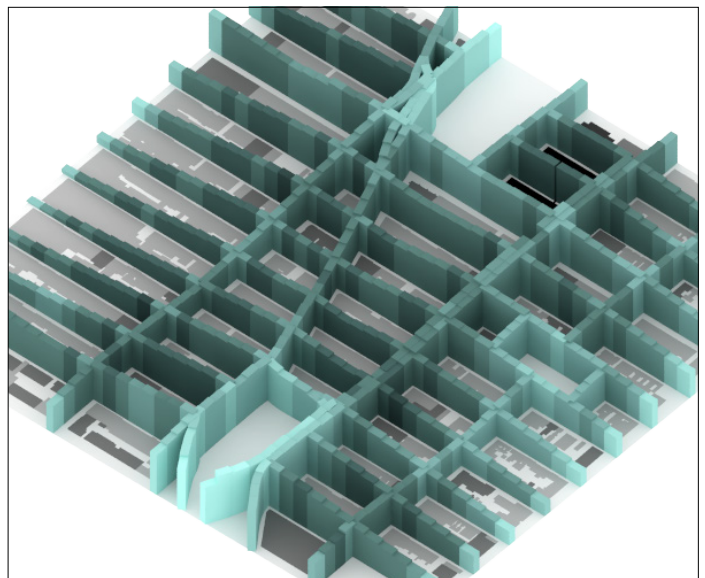
Visualization of walkability, sky exposure, and FAR near Union Square, NY

Session A - Parametric Evaluation and Speculative Housing Typologies

In session A students will focus on learning the fundamentals of the integrated XIM methodology. This will include spatial evaluation techniques, parametric massing basics, optimization, and data based decision-making. Teams will work together to create a custom evaluation system and use it to explore new housing typologies in New York City. Because teams will working on adjacent sites, the speculative typologies will impact each other necessitating the exchange of grasshopper tools and massing among teams. In the end, teams will propose a new building or block typology based on their evaluation criteria and informed by the work of the other teams. The new typologies will be deployed at the urban scale in session B.

Session A schedule
Week 1: Introduction to spatial evaluation techniques
Week 2: Basic parametric massing
Week 3: Introduction to optimization and how to combine and weight metrics
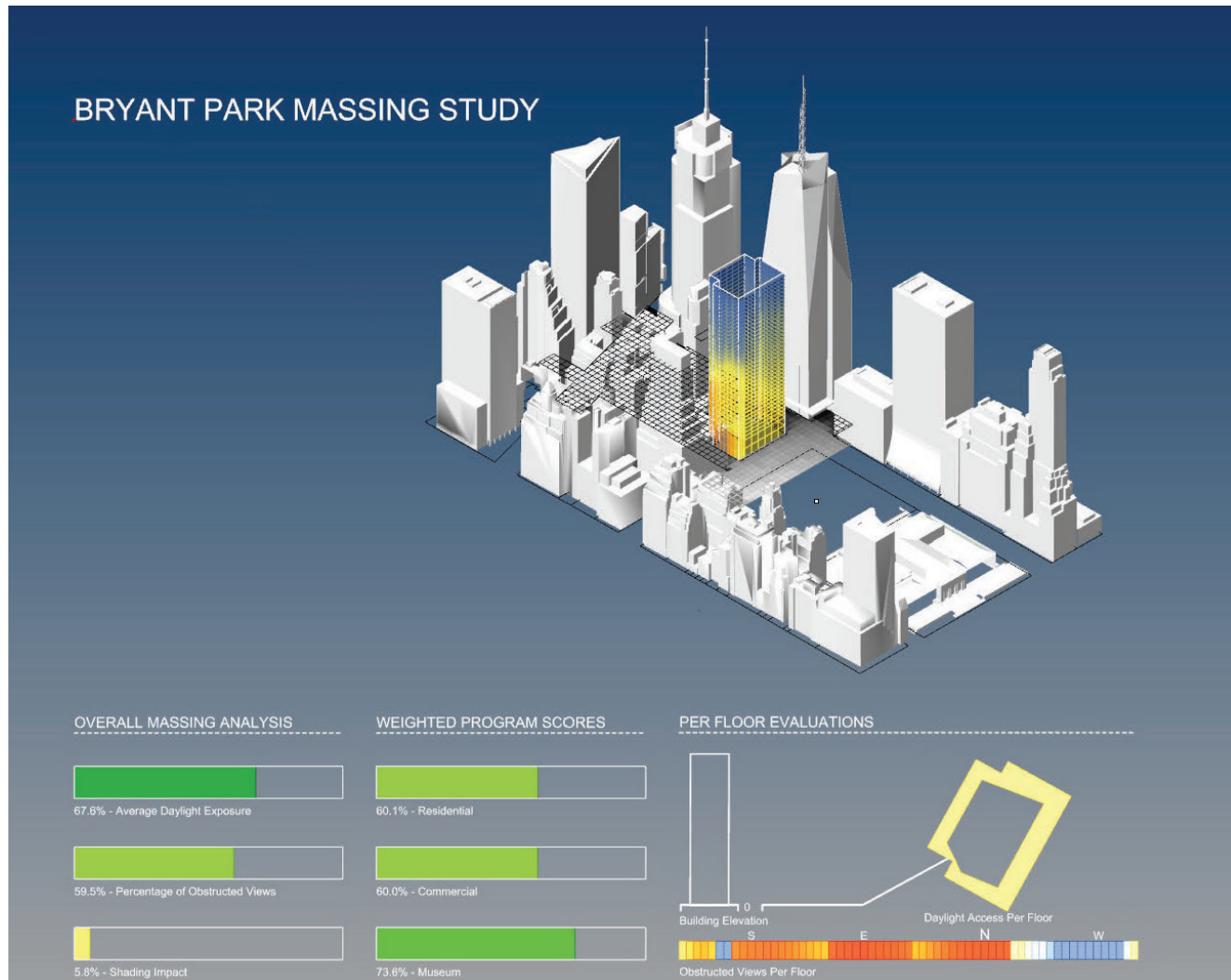Saturday Help Session
Week 4: Review assignment 1 & optimization continued
Week 5: Platypus, animation, & clusters
Week 6: Introduction to metric visualization and dashboards & XIM system integration
Saturday Help Session
Week 7: Review assignment 2

BRYANT PARK MASSING STUDY

OVERALL MASSING ANALYSIS

67.6% - Average Daylight Exposure

59.5% - Percentage of Obstructed Views

5.8% - Shading Impact

WEIGHTED PROGRAM SCORES

60.1% - Residential

60.0% - Commercial

73.6% - Museum

PER FLOOR EVALUATIONS

Building Elevation

0

S   E   N   W

Daylight Access Per Floor

Obstructed Views Per Floor

XIM System. Juan Pablo Azares, Eileen Chen, Jim Stoddart, RayWang

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Session B - Urban Analysis and Application of Speculative Housing Typologies

Session B will advance the topics of session A (evaluation techniques, parametric massing and optimization) and introduce grasshopper techniques focused at the urban scale. Through streaming in geotagged data sets, including GIS, PLUTO, 311, Twitter, and Flickr, students will develop urban filtering criteria to identify sites across New York City appropriate for the speculative building or block typologies designed in session A. Teams will work simultaneously at the urban scale to choose sites and deploy their typologies and at the building scale, refining their typology based on the various urban conditions encountered. In the end teams will propose urban filtering criteria focused around housing issues, new typologies, and an urban scale application of the proposed typology.

Session B Schedule:

Week 8: Streaming GIS and other external data sources
Week 9: Advanced Parametric Massing Techniques
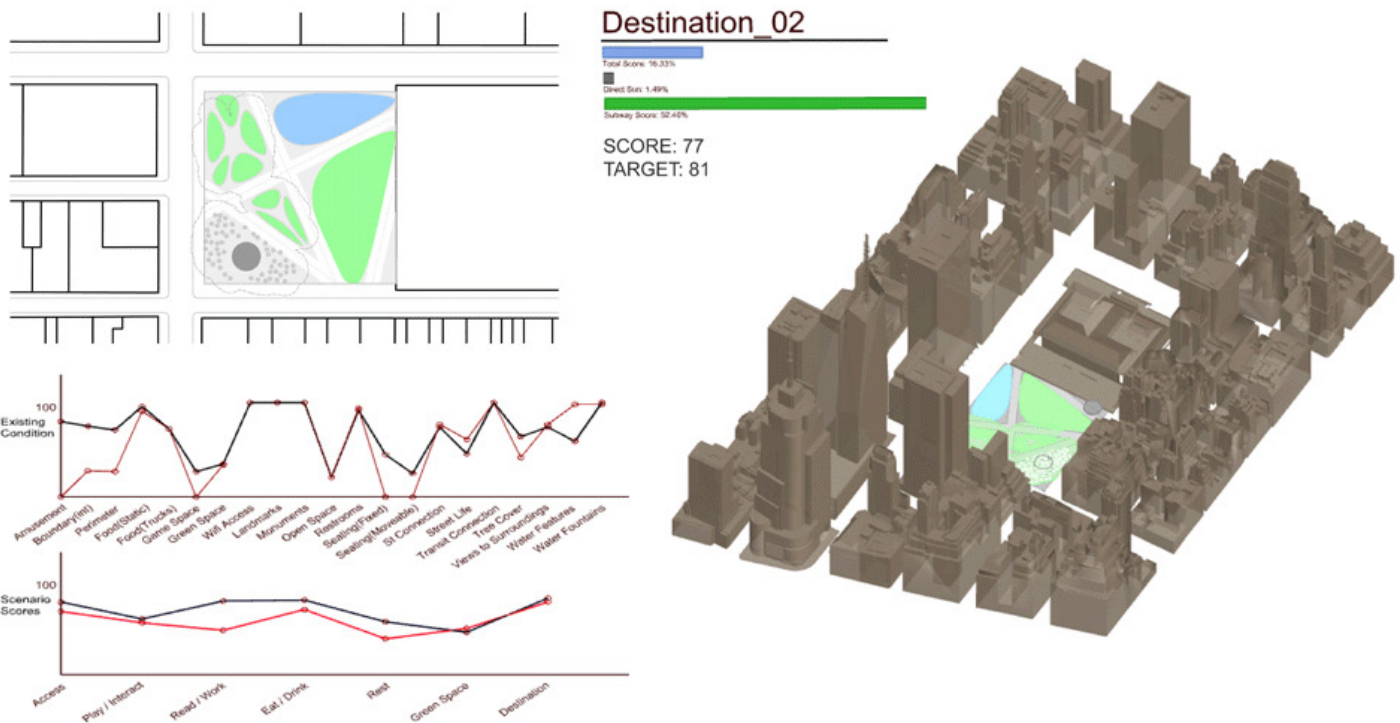Saturday Help Session
Week 10: Review assignment 3
Week 11: Advanced Visualization Techniques
Week 12: Performative Detailing
Week 13: Individual project desk crits
Week 14: Final Review (assignment 4)

Bryant Park Iteration. Christopher Botham & Sangyoon Kim

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