

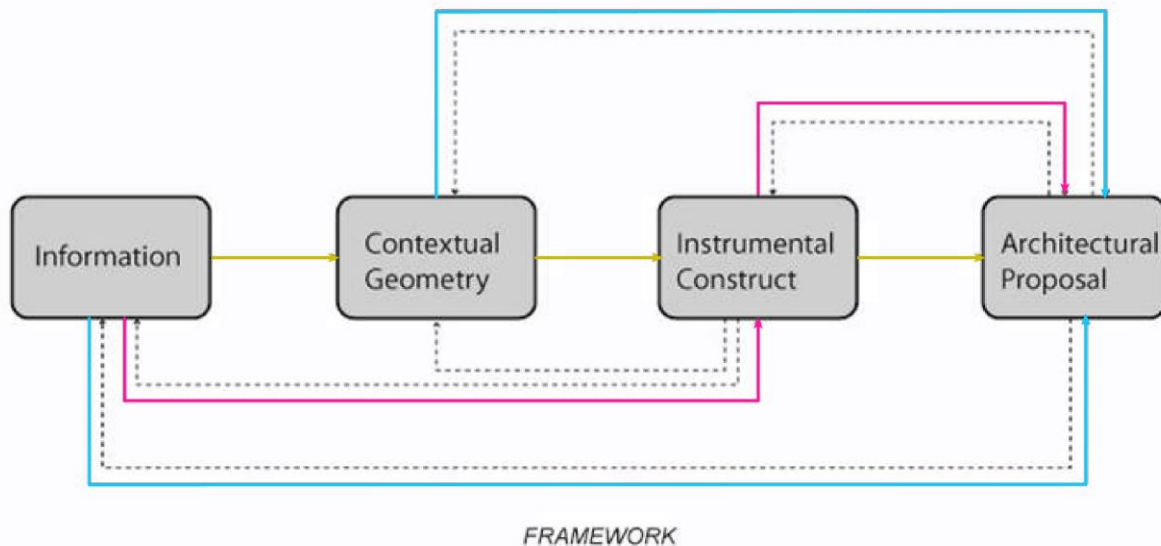
## Field of Play

Instructor = Brian W. Brush [bwb2104@columbia.edu](mailto:bwb2104@columbia.edu)  
 Class Time = Tuesday 9 am to 11am (Session A & B)  
 Class # 4741 Field of Play 1 and A4758 Field of Play 2

## Overview

Architecture is a discipline of cultural and artistic production characterized by the negotiation of imagined possibilities with significant real constraints. One such constraint, the constraint of site, tasks the designer to distill, through various interrelated processes of observation, abstraction, representation, and materialization, an infinite realm of possibilities into what can be achieved at a particular place and time.

However site is not limited to the conventional notion of a demarcated plot of land on which to build a building. Site is also the social, cultural, political, economic, environmental, historic, and technological contexts within which a project is situated. Moreover, site is not limited to a single location, but is extensive, incorporating and indexing distant related locations as prototypical instantiations of a larger territorial condition. Architects qualify these conditions of site through the collection, creation, and interpretation of spatial data. The manifestation and translation of this data into physical and spatial form is an essential part of architectural design.



## Session A: Field of Play 1 (prerequisite for Session B: Field of Play 2)

This class will use GIS as the primary computational platform for collecting, creating, interpreting, and representing 2D and 3D geographic data in service of articulating spatial conditions of a site for design. Class workflow will follow a procedure of 1) data gathering through virtual data mining, sensing with GPS, and data creation 2) data analysis and representation in GIS, 3) data translation through export/output to various design and visualization platforms such as Google Earth, Rhino, Max, Illustrator etc.

The final product or deliverable of the class will be an image or series images which represent spatial data about a site through mapping in GIS, composited with a translation of the map geometry re-purposed as a 3-dimensional scaffold for a design proposal to be developed in Session B Field of Play 2. Construction of this scaffold should be considered an opportunity to assimilate and then challenge conventional mapping techniques. Through this line of inquiry students have potential to invent new modes of data representation that allows GIS to act as a design tool as well as a supporting system of documentation.

#### DEFINITIONS:

MAPPING is a key component of site investigation because maps inform design by allowing designers to articulate spatial relationships that might not have been otherwise explored.

DATA is the key component to making maps. The science of mapping is based on the idea of making data visually interpretable. In other words maps allow us to decipher the spatial nature of data. Data can be found or collected - we will explore finding both types.

GIS is a visual database. It allows one to interpret and visualize spatial data. GIS files are database files, and therefore, act as a repository for a wealth of information about place. The power of GIS is therefore leveraging this information to form critical representations and manifestations of site.

#### SCHEDULE:

Class meets Tuesdays in Fayerweather 202 from 9-11am unless otherwise noted.

##### CLASS # 1 January 21<sup>st</sup>, 2014 – ArcGIS 10.1 Fundamentals

We will cover what a Geographic Information System is and discuss the logical and technical aspects that create its structure. We will also cover fundamental 2D cartographic techniques to familiarize you with the ArcGIS interface.

\*\* Assignment: Readings and Assignment 1: Upper East Side FAR Map

##### CLASS # 2 January 28<sup>th</sup>, 2014 - Geometric Functions, 2D Exporting and Manipulation

We will use a number of geometric tools in GIS such as buffer, clip, merge, to create analytical 2D geographic entities. We will learn how to export 2D vector data for use in design softwares like Illustrator, Rhino, and 3DStudioMax.

\*\* Assignment: 2D Self-guided Tutorials for Assignment 2 Bronx land use map

##### CLASS # 3 - Harvesting GPS data in the Field DATE/TIME/LOCATION TBD

Students will learn how to use a GPS device to harvest spatial data in the field. Students will learn how to collect data with mobile-based applications such as iGIS and transfer both to ArcGIS. NOTE: Class will meet OUTSIDE off site, location TBD.

\*\* Assignment: OMI Asset Mapping

##### CLASS # 4 February 11<sup>th</sup> 2014 – ArcScene 3D: Extrusions, Topographies, and Surface Analysis

We will cover the 3D ArcScene interface to generate "3D buildings" and 3D surface density maps for export.

\*\* Assignment – Mapping 311 Noise Complaints in XY Data

##### CLASS # 5 February 18<sup>th</sup> 2014 – Geometric Transformations and Translations with Spatial Analyst

Students will explore different techniques for transforming and translating data to create analytical representations of NYC street tree data. We will focus specifically on interpolated raster surfaces, density surfaces and 3D contouring.

\*\* Assignment – Transformation/Translation Catalogue

\*\*Final Project proposal Assigned

\*\*FINAL PROJECT PROPOSAL DUE FRIDAY FEBRUARY 21<sup>st</sup> by email to instructor

##### CLASS # 6 February 25<sup>th</sup> 2014 – Harvesting data from web-based sources

Students will learn how to search, download, and translate data from Google Earth as .kml and .kmz files for use in ArcGIS.

\*\* Assignment: Google-based data density map, data type to be chosen by student

##### CLASS # 7 March 4<sup>th</sup> 2014 – Final Project Presentations

Students will present their final project to the class and the Director of Architecture OMI Peter Franck.

Other mapping tools such as Meerkat for Rhino/GH and Rhino Terrain will be demonstrated.

GRADING:

Weekly Attendance – 30%

Completion of Assignments – 30%

Final Project – 40%

Session B – Field of Play 2

This course will investigate techniques for visualizing spatial data as instrumental geometry for the design and fabrication of a full-scale site-specific outdoor exhibition pavilion to be built at OMI International Arts Center near Hudson NY at the end of the semester. The course will be divided into two sessions over course of the semester. The first session introduces students to spatial data visualization through ESRI ArcGIS and other data collection and analysis tools such as GPS, iGIS mobile, and 123D catch in the context of site analysis at OMI. The second session will focus on translating these visualizations through parametric protocols in Rhino and Grasshopper into 3D models detailed for fabrication. The artefacts of investigation will be spatial mappings translated and transformed for fabrication of a full-scale, site-specific architectural intervention. As a manifestation of contextual data flows, the intervention tests architecture's ability to communicate information critically and thoughtfully in the public domain.

SCHEDULE:

Class meets Tuesdays in Fayerweather 202 from 9-11am unless otherwise noted.

CLASS # 1 March 11th, 2014 – Basic Parametric Operations in GH

SPRING BREAK NO CLASS MARCH 18<sup>th</sup>

CLASS # 2 March 25th, 2014 – Geographic to Parametric Translations

CLASS # 3 April 1<sup>st</sup> – Harvesting Site-Specific GPS data in the Field DATE/TIME/LOCATION TBD

CLASS # 4 April 8th 2014 – Parametric Model Development

CLASS # 5 April 15<sup>th</sup> 2014 – Parametric Detailing

\*\*Final Project proposal Assigned

CLASS # 6 April 22nd 2014 – Final Project Consultation

\*\*FINAL PROJECT PROPOSAL DUE

CLASS # 7 April 29<sup>th</sup> 2014 – Final proposal Review

Other mapping tools such as Meerkat for Rhino/GH and Rhino Terrain will be demonstrated.

GRADING:

Weekly Attendance – 30%

Completion of Assignments – 30%

Final Project – 40%