**Study Plan**

<table>
<thead>
<tr>
<th><strong>Personal information</strong></th>
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<tbody>
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<table>
<thead>
<tr>
<th><strong>Studio</strong></th>
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<tbody>
<tr>
<td><strong>Theme</strong></td>
<td>Hyperbody: NS&amp;IA</td>
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<tr>
<td><strong>Teachers</strong></td>
<td>Dr Henriette Bier, Dr Nimish Biloria</td>
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**Argumentation of choice of the studio**

During my hitherto study and work experiences, I have been exposed to a classical approach towards architecture: one that values aesthetically pleasing propositions. I have been trained to seek beauty in details, materials and their assemblages. I have been trained to draw, sculpt, paint and render my visions. But it was not really enough for me, I felt that architects can do so much more than just propose nice trinkets.

I took interest in what architecture could do besides that: I saw projects that solve real issues or address real questions that arise in a modern society. I have a clear goal for my professional life – I want to have my own practice and make a difference in the place I live, as much as an architect can. The Hyperbody studio offers me a completely new set of tools that can help me achieve that. I am challenged to learn new skills, read new books and think in a new way. I am being trained to use a computer not as a drawing board, but as a powerful instrument that helps me grip the complexity of a design problem.

**Title**

| **Title of the graduation project** | Buffering Zone |

**Product**

**Problem Statement**

The posed problem, research questions and design assignment. This should be formulated in such a way that the project can answer these research questions.

The definition of the problem has to be significant to a clearly defined area of research and design.

I chose the site with an ongoing conflict between neighboring stakeholders. The location is Huta (steel plant) in Warsaw, a huge industrial complex that was imposed on the city over sixty years ago. Now, as the city spreads and develops, Huta is being surrounded with residential estates. The current conflict emerged when part of the complex (now modernized and limited in size) was sold and intended for housing. The developer's project was stopped due to resistance from steel plant owners, who claim that the site is too close to the plant to be habitable. The project is in deadlock and Warsaw is in need of new housing. Rather than let the city sprawl further, I think it is desirable to try to find a solution to let both entities (industrial and residential) coexist. I am proposing a buffer between them, a zone where the negative influence from both sides get neutralized and where added value emerges. I investigate possibilities to transform industrial land back into food-producing land. I look into ways of making former antagonists good neighbors – that share benefits of having a filter that meets their needs instead of a wall between them.

This is why I intend to focus on finding a functional balance in the buffer zone and to create (with help of responsive skin) adequate microclimates for differentiated needs within the building.

1/20/2014
**Goal**

This section has to include answers regarding what the intentions of the graduation project are.

My goal is to find a state of dynamic balance (homeostasis) in the proposed industrial-residential buffer system and differentiate environmental conditions within it through morphological intelligence. My project has to minimize the negative impacts from both sides (noise, uncontrolled flow of people) and enhance the desired ones to suit the needs of the neighbors. The structure will contain a variety of different conditions to support different functions that are needed to serve the neighbors. The essential part of this will be building's skin: a conductor of particles and phenomena, that will enable one part of the buffer to grow food and other to be a school through filtering of flows of sun, wind, CO2, O2, warmth and humidity.

**Process**

**Method description**

Description of the methods and techniques of research and design, which are going to be utilised.

Since my project is about generating varied interrelated spatial and microclimatic conditions, I need to clearly state the strategy for dealing with complexity of the problem. My approach is to use software widely used by non-standard architecture creators in a specifically defined way, as explained in the graph:

![Diagram](image)

I start with a global composition of the system: using Processing for simulating possible clusters of set functions, testing various concentrations of elements and looking for aggregation that would most effectively block noise from industrial activity (height is considered the most important factor). After generating clusters, I intend to move to a local (understood as a representative part of a setup, not the whole structure) scale and use the data (coordinates of elements) to experiment with filling the voids between the elements in Rhino/Grasshopper software combo. The filled voids that constitute skin and structure of the buffer will be investigated for perforation levels that enable flow of previously mentioned phenomena to sustain the functions. I intend to look for embodiment with experiments in topological transformations and assessing their environmental performance in Ecotect. The setup is interconnected and both global (Processing) and local (Rhino/Grasshopper, Ecotect) models inform each other of changes or needs for revisions.

**Theoretical and practical references**

Theoretical (historical, socio-political, scientific and technical research) and practical knowledge that will be consulted.


DeLanda, 'Material Complexity', in Neil Leach, David Turnbull and Chris Williams (eds), Digital Tectonics, John Wiley & Sons (Chichester), 2004


**Reflection**

<table>
<thead>
<tr>
<th>Relevance (and output)</th>
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<tbody>
<tr>
<td>The value of the graduation project within the larger socio-cultural and scientific context. List of output with respect to conceptual and design development as well as materialization and construction documents.</td>
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I want my project to be a voice in a discussion on coexistence between different built environments in the world with less resources and more needs. I hope it can be an example of architecture solving problems that arise when contexts are mixing and vital social, historical and economical changes appear. I hope it can make a difference in the real life: I intend to present it to both conflicted stakeholders to show them it is possible to mediate between differing needs and my idea how to do that.

**Presentation:**
- Interactive presentation showing concept, information models, and behavioural diagrams.
- 3D-4D parametric models showing the design within the site at the phase of concept design, design development and construction design.

**Design:**
- Context analysis
- Influence of architectural elements and overall shape to environmental energy sources
- Explorations of vector and particle systems to define the environmental energy flows of the Port of Rotterdam.

1/20/2014
Development of building massing according to the volumetric requirements of each function, accessibility and requirements for energy generation.

**Materialization and Construction:**
- Plans, façades, sections, and details obtained from the 3D model (1:1000, 1:500, 1:200, 1:100, 1:50, 1:20, 1:10, 1:5)
- Structural explorations for robotic and CNC fabrication.

**Physical CNC or robotic fabricated model developed from the 3D parametric model**

<table>
<thead>
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<th>Time planning</th>
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<tr>
<td><strong>P1: November 2012</strong></td>
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<tr>
<td>+ Thematic and theoretical research.</td>
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<tr>
<td>+ Relevance in the larger socio-cultural and scientific context</td>
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<tr>
<td>+ Situation, history of conflict and environmental research of the location.</td>
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<tr>
<td>+ Research question(s)</td>
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<td>+ Exploration of the NS &amp; IA tools</td>
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**P2: January 2013**
+ Processing-based simulation of a global system of functions interacting with each other
+ Architecture draft design based on the simulation output within the context of the site:
  - Location - 1:5000 / 1:500
  - Plans, façades, sections – 1:200 / 1:100
+ Functional requirements, documentation of the process
+ Graduation plan.

**P3: April 2013**
+ Determine the final design by critically improving the previously created tools for P2; experiments in topological transformations in Rhino/Grasshopper
+ Architecture:
  - Location plans (urban scale) - 1:1000 / 1:500
  - Plans, façades, sections - 1:200 / 1:100
  - Plans and cross-cuts of relevant sections of the building - 1:50
  - Façade fragment - 1:20
  - Details - 1:10 / 1:5
+ Start evaluating the environment in Ecotect

**P4: May 2013**
+ Refining the building (construction).
+ Architecture:
  - Location plans (urban scale) - 1:1000 / 1:500
  - Plans, façades, sections - 1:200 / 1:100
  - Plans and cross-cuts of relevant sections of the building - 1:50
  - Façade fragment - 1:20
  - Details - 1:10 / 1:5
+ Structure and materialization design for the Rapid Prototyping.
+ The physical model CNC or Robotic fabricated as a proof of concept of construction system.
+ Modification and further refinement of the architectural design due to the structural and climatic results.

**P5: July 2013**
- **Wrap-up presentation**
+ Interactive presentation showing concept, information models, and behavioral diagrams.
+ Theoretic and thematic support of design and research to frame the position of the project within...
the Interactive Architecture Domain.  
+ Architecture:  
  Location plans (urban scale) - 1:1000 / 1:500  
  Plans, façades, sections - 1:200 / 1:100  
  Plans and cross-cuts of relevant sections of the building - 1:50  
  Façade fragment - 1:20  
  Details - 1:10 / 1:5  
+ Perspectives and orthogonal views of the design.  
+ Physical model (CNC/robotic fabrication)

**Attention**  
Part of the graduation (especially in the MSc 4) is the technical implementation of the building design. Therefore a Building Technology teacher will be involved in the tutoring team from the P2 presentation on. This should be taken into account when writing the study plan / personal graduation contract, with respect to the time planning as well as in the relation to the content (e.g. statement, method and/or relevance).