## Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

<table>
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<tr>
<th>Personal information</th>
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<tr>
<td><strong>Name</strong></td>
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<td><strong>Student number</strong></td>
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<td><strong>Telephone number</strong></td>
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<th>Studio</th>
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<td><strong>Name / Theme</strong></td>
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| **Teachers / tutors** | Pirouz Nourian
Elvin Karana |
| **Argumentation of choice of the studio** | I chose Design Informatics, because of my interest in computation, optimization and exploration of new applications of technology in architecture. I preferred a focus on materials, because materialization of these technologies is the essential part of these technologies to be introduced to architecture. |

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<tr>
<th>Graduation project</th>
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<td><strong>Title of the graduation project</strong></td>
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<th>Goal</th>
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<td><strong>Location:</strong></td>
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<td><strong>The posed problem,</strong></td>
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materials and fabrication process that are optimum for a variety of functions and systems; including structural design, climate design, material flow, human circulation, etc.

**research questions and design assignment in which these result.**

How could computation perform multi-level optimization through growth in architecture?

Introduction of new materials and fabrication methods and depleting resources call for innovation in our design methods.

Innovation in design methods, that are customized and optimized for their specific location, performance, function and materiality can help save large amounts of resources both during the construction and operation of the buildings.

Since these kinds of optimizations are vastly and successfully used in nature, using natural algorithms and bio-inspired methods to generate multi-functional complex forms can reduce the material and component use in architecture.

This project aims to generate optimized forms using natural algorithms and test this methodology using the case study of a bust station in Rotterdam.

**Process**

**Method description**

This is a two-fold research focusing on computation and materialization. It is mostly an experiment-based research. The two-fold nature of the project requires a two-fold methodology; computation and material research.

**Material Study**

Material research will focus on potential materials and fabrication methods for a growing architecture. Samples of different materials through different mass customization methods will be produced. These samples later will be tested for their performance.

**Computation**
As a result of algorithm research, a computation model will be developed. Data obtained from material study will be combined with the computation model by virtual simulations. These simulations will be used to design the case study proposed.

**Literature and general practical preference**

The research includes academic articles, books, ebooks, encyclopedia and dictionaries, dissertations on materials, fabrication, computation, algorithms, biology, biomimicry and living construction. Throughout the research, I will be using software tutorials to create and simulate my own computational model. The project will benefit from practical experience, maps, physical models and physical tests on the models.


## Reflection

### Relevance

By shifting to materials that are more sustainable and to forms that uses resources efficiently, we can reduce our impact on the environment. Integration of the different aspects of design is an aspect that exist in nature quite effectively. Using the algorithms in nature to generate complex effective form could be an approach to reduce our environmental impact. The experimentation of these algorithms for optimizing the forms is quite limited in architecture, despite its high potential. A robust multi-level optimization could be achieved using models readily available in architecture.

## Time planning

Please refer to the time table below.