Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences
**Graduation Plan: All tracks**

Submit your Graduation Plan to the Board of Examiners ([Examencommissie-BK@tudelft.nl](mailto: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>
<thead>
<tr>
<th><strong>Personal information</strong></th>
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<td><strong>Name</strong></td>
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<td><strong>Student number</strong></td>
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<td><strong>Teachers / tutors</strong></td>
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<td><strong>Argumentation of choice of the studio</strong></td>
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<td><strong>The posed problem,</strong></td>
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little cross-disciplinary debate, and a mutual theoretical and methodological framework is far from reality. The last, but maybe the most important issue that this research aims to address, is the applicability of research outcomes into improvement of sensory and perceptual urban design. In general, we can say that the above methods provide little objective, and no empirical cross-disciplinary research methods, and the researcher misses out on accidental (and potentially crucial) information of user experience. Current mobile sensory technology allows us to measure eye-tracking and physiological activities in our body when perceiving our environment. This way we can get a step closer to an empirical approach to environmental perception and how, for instance, certain “textbook design principles” influence our perceptions and eventually our emotions. I hereby hope to set a base for future studies on the relation of perception and space.

| research questions and design assignment in which these result. |
| Which spatial elements are key factors in influencing our perception and appraisal of different urban environments? |
| Can we optimize the perception and appraisal of the worst perceived and appraised case, by solely re-designing the perceptually influential spatial elements? |

**Process**

**Method description**

This experimental research will take place outside, in the city, and use state-of-the-art mobile electroencephalogram (EEG), and eye-tracking technology to calibrate measured brain activity with attended stimuli in urban scenes. This way, the goal is to bridge the disciplines of urban design, environmental psychology, psychophysics, and psychophysiology. With this innovative approach, we can create a base for empirical research on the perception of landscapes and urban scenes. The methodology uses quantitative measurements, commonly used in object perception research, and applies it in environmental perception research. Qualitative methods in the form of semi-structured interviews with the subject will address cognitive and appraisal phenomena, which are not quantifiable with technological tools and scope of this research. Ex-ante interviews will address the cognitive bias, or pre-attended cognition. Interviews ex-post will address remembered emotions to define subtle appraisals (e.g. where arousal is not present).

**Literature and general practical preference**


Reflection

Relevance

As human beings we are always (sub)consciously perceiving and interacting with our environment. As designers therefore, we try to design healthy environments that not only look good aesthetically, but also function in a technical and sustainable way. Consequently we discuss social behavior and centralize the “human scale” in our designs, but we somehow tend to neglect the important fact in how we actually perceive our environment in cognitive and psychological terms. By making this perceptive process, what we see, hear, smell, feel and more importantly, what our mind makes of it, more tangible, we can achieve a better understanding how the built environment affects the body and mind.

To create a liveable environment we use two biased methods (van Dorst, 2005). The first is measuring perceived liveability. The problem with this method is the cognitive bias of every individual and the sub-conscious influence of the physical environment on wellbeing. A simple example; users of a shopping street are not always aware of the trees present, yet benefit by the stress reducing effect of green (Kaplan & Kaplan, 1989). The second method is called presumed liveability; here we presume all kind of influences on the well-being of people by qualities of the environment, although we can not measure any cause-effect relations. Cleaner streets were presumed to be more liveable; the correlation is there, and yet no cause-effect relation is proven (van Dijk & Oppenhuis, 1998). New technology can help us here to measure perceptions more objectively in relation to physical well-being. By relating this data to the built and natural environment.
we can evolve from a biased way of measuring liveability to a more inter-subjective way of measuring. On policy level, this dichotomy can lead to a negative spiral of a neighbourhood its image, which in turn can lead to segregation, promoting a biased perceived liveability. At street level, identification of perceptually influenced spatial elements, can lead to better (perceived) designs in terms of user-experience. E.g: a mere replacement of pavement in a neighbourhood by the local municipality can be done more qualitatively, regarding the perceptual information and meaning that the surfaces hold.

**Time planning**

January:
- Project kickoff!
  - Run tests with devices and small groups of students in pilot case CP, Poptahof, Delft.
  - Get familiar with software and data collection & processing.
  - Document first results.
  - Look for patterns and relations.
  - Adjust methodology & practicalities according to test results.
February:
  - Evaluate first hypotheses and start second case C2, Kristalweg, Delft.
  - Start concise data collection process.
  - Analyze & map the first data in multiple scales (2D maps, 3D models, and street view eyetracking analyses).
March:
  - Start C3, Raamstraat, Delft
  - Start C4, Start C5
  - Test developed hypotheses
  - Initialize design parameters
  - P3 presentation
April- June:
  - Create virtual mockups of architectural affordances
  - Evaluate with subjects
  - Assess final results
  - Document & write conclusions
  - P4 presentation
  - P5 presentation