



**PETER NØRKJÆR GADE**

PhD defence

**ECOLOGICAL BIM-BASED  
MODEL CHECKING**

**28. AUGUST 2020  
KL. 9-13**

Auditorium  
Rendsburggade 14  
9000 Aalborg



**DEPARTMENT OF THE BUILT ENVIRONMENT**  
AALBORG UNIVERSITY

## PHD DEFENCE BY PETER NØRKJÆR GADE

Ecological BIM-based Model Checking

PhD defence organized by Department of the Built Environment, Aalborg University

### TIME

Friday 28 August 2020, 9:00 – approx.13:00

### HOW TO PARTICIPATE

Please send an email to [Linda Vabbersgaard Andersen](mailto:Linda.Vabbersgaard.Andersen@aabu.dk) no later than 26 August 2020 and you will get an invitation for the event or a copy of thesis if requested.

### WHERE

Auditorium, Rendsburggade 14, 9000 Aalborg. Due to Covid-19 Aalborg University will follow the Danish Health Authority guidelines and the PhD defence will be carried out via Skype for Business if updated guidelines demand so.

### SUMMARY OF THE THESIS

This thesis presents a novel approach to develop BIM-based Model Checking (BMC) systems named Ecological BMC. BMC is a method that makes use of BIM-models to automate a checking process of, e.g., sustainability or building codes rules. Such a method can potentially yield significant results by improving the speed, consistency, and precision of the checking process and results. However, BMC systems have been challenging to develop and use by practitioners due to socio-technical challenges. Attempting to improve BMC-system's development, the practitioner's context was investigated through various inquiries to understand better the socio-technical factors relevant to BMC systems use. The findings from the inquiries were used to develop prototypes that were tested with practitioners to evaluate their performance. The insights of the inquiry, prototype development, and evaluation were used to suggest improvements to the practical applicability of BMC systems based on ecological rational perspectives on BMC systems development. An ecological rational perspective means that rationality is not derived deterministically, but more from an ecology, i.e., context of the rationale. To ensure an Ecological BMC-system, it must be situated in the business; its rules formulations based on heuristics; emphasize rules transparency and flexibility, and provide performance tracking.

### ASSESSMENT COMMITTEE

- Assoc. Prof. Pär-Ola Zander, Department of Culture and Learning, AAU (chairman)
- Head of section, Assoc. Prof. Jan Karlshøj, Department of Civil Engineering, (DTU)
- Prof. Eilif Hjelseth, Department of Civil and Environmental Engineering, (NTNU)

### PHD SUPERVISOR

- Supervisor, Assoc. Prof. Kjeld Svidt, Dept. of the Built Environment, AAU

### MODERATOR

- Assoc. Prof. Olena Kalyanova Larsen, Dept. of the Built Environment, AAU

### GRADUATE PROGRAMME

- Civil Engineering

### PROGRAM

**09:00:** Welcome by Moderator

**09:05:** Lecture and presentation by PhD student (45 min)

**09:50:** Break

During the break, participants can contact or email questions to the moderator, Olena Kalyanova Larsen [ok@build.aau.dk](mailto:ok@build.aau.dk)

If such are received, the questioner puts them forward after the assessment committee has finalized their question and answer round

**10:00:** The assessment committee is asking questions to the work

**12:00:** End of defence. The assessment committee enters another room, evaluates and writes the final assessment

**12:45 (approx.):** The assessment committee rejoins the Defence room and announces its decision

**13:00:** Reception in auditorium