Build-r AB
Tullvaktsvägen 2, SE-115 56, Stockholm, Sweden
Tel +46 (0)70 749 35 73
r.pettersson@build-r.com
www.build-r.com

DECEMBER 4, 2018

SIMULATION MODELING & MACHINE LEARNING, MASTER THESIS SPRING 2019

About Build-r

Build-r is a robotic construction company, founded two years ago, with the vision of bringing decades of proven technology from the field of industrial robotics and automation to the construction industry. The company focuses on the process of interior wall installation using gypsum and plywood boards and have recently finished the development of the first industrial scale prototype making Build-r one of a few players globally to compete for the leading position within construction automation.

The position

Build-r is now looking for a Master Thesis student for spring 2019 with an interest in machine learning and process simulation modelling using cutting edge computational science.

You are solutions-oriented, self-motivated and like the idea of building first-of-a-kind.

We believe a Master Thesis project is a great way of getting to know each other for possible future full time-employment.

The task

Based on highly detailed object-oriented models of a building's interior wall system (the studs and the boards), as well as experimental data from empirical tests and simulations of Build-r's robot, the task will be to develop a discrete event simulation model for the automated installation process.

The model will include an algorithm for path generation and installation activity sequencing of a given area of the building. When running the algorithm, screening of activities for their feasibility based on the robot's current limitations will be necessary. Using the screened sequence of installation activities, a discrete event simulation will generate time stamping of all activities and a probabilistic model for the total time of performance of the full process.

The simulation model will need to allow for iterative adjustments both regarding the robot's limitations (things the robot can and cannot do) as well as the distribution of time for each installation activity as the robotic system performance improves and more data is generated. The model should also allow for machine learning methods or similar to improve the model's predictions automatically as the access to empirical data from live projects will become increasingly accessible.

The model will be used to predict the need of resources (materials, manpower, and time) long before the live installation is performed to estimate the costs and benefits of using robotics in each project. A graphical representation of the simulated process will be generated using industry standard design software and the simulation results will also be used to communicate with material suppliers and customers.

If this sounds interesting to you, please don't hesitate to contact us!

Rasmus Pettersson, CTO Build-r