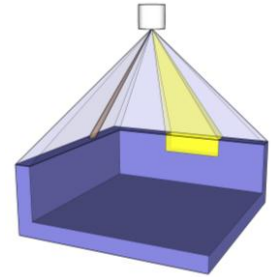


Nano- to meter-scale building (n2mB) – motivation, concept and requirements

Nano- to meter-scale building is a concept of a future green technology of automated building based on bionanorobots using Carbon from CO₂ from the air as the only building material.

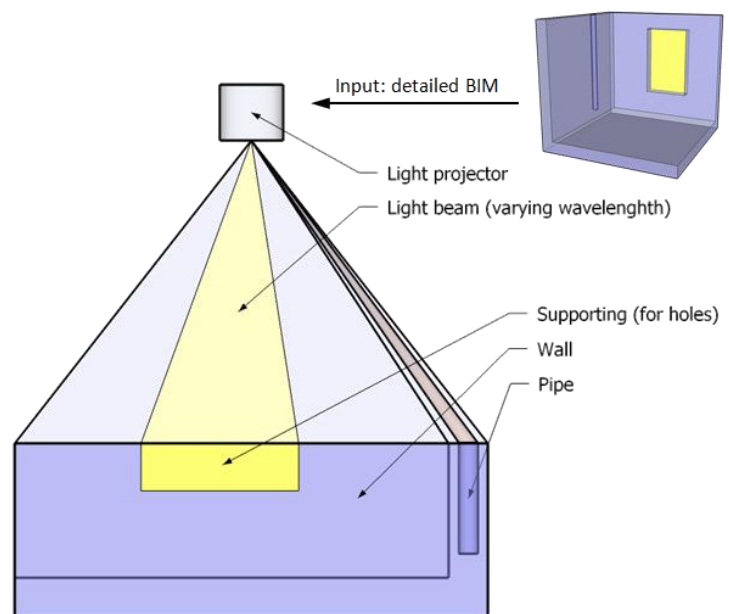


Motivation

- New ways of building without negative impacts on the environment
- Reduce man-made CO₂ in the air (instead of produce)
- Cover demand for adequate housing (1/4 population can not afford it)
- Move construction higher in the research agenda by motivating nano and biotechnology development to reply to n2m building requirements

Concept

- bionanorobots iteratively build CNT (carbon nanotube) 3D structure from the ground level until the top of the building is reached
- bionanorobots are controlled and powered remotely by projected light
- the light image is a 2D projection of the 3D model of the building (BIM), whereby the section plane is constantly moving from the bottom to the top of the model
- various wavelengths sensed by bionanorobots are compiled into instructions
- bionanorobots extract C from CO₂ to build compact CNT 3D structure (CNT characteristics vary according to instructions)



Requirements

1. Detailed and specialized Building Information Model
2. Compact 3D Carbon Nanotube structure with varying required characteristics (strength, friction, conductivity, transparency, self-decomposition,...)
3. A light projector with required resolution, power and functionality
4. Bionanorobots able to
 - a. recognize different wavelengths and compile them into instructions
 - b. extract C from CO₂ from the air
 - c. produce 3D CNT structure

