M. BECHTHOLD, A. KANE, J. KING, P. MICHALATOS. ***Robotic tile placement: Tools, techniques, and feasibility.*** *Gerontechnology 2012;11(2):360;* doi:10.4017/gt.2012.11.02.498.00 **Purpose** The project develops an integrated digital workflow[1] for robotic tile placement, a novel construction method that allows for off-site use of industrial robotics for on-site tile surfaces, and a feasibility study for implementing the approach in the context of the tile industry. The proposed approach overcomes limitations of existing methods that focus merely on efficiency[2,3]. Instead, the proposition of the research is to enable the installation of unique, one-off, and highly complex tile patterns impossible to install economically by hand. **Method** The research uses a design experiment to develop computational and robotic technologies. Several design studies were prototyped as a proof of concept. Issues of construction integration and industry implementation were researched and advanced through interviews with experts in the field, field studies, and an extensive literature research that includes a review of U.S. tile installation standards[4]. **Results & Discussion** The novel workflow includes several computational approaches to generate tile patterns too complex to install economically by hand. Weighted randomness or patterns processed based on the analysis of bitmap images produce tile patterns within the cost-effective Rhinoceros platform. Robotic code for the running of a robotic work cell is created automatically by the integrated code generator. The code can be simulated through a newly integrated tool that permits tool path visualization as well as cost and time estimates. Regarding construction integration the research largely replaces manual tile installation to a high degree. The paper describes logistics and installation strategies for pre-tiled panels along with recommending specific material combinations. An initial feasibility study identifies fundamental parameters such as set up and placement times, adhesive application, and many more. The study allows an estimation of basic cost parameters in the context of specific construction markets, based on an assumed value of a niche tile product that employs highly complex patterns. Robotic tile placement ultimately adds value for tile producers by moving installation of specialty tile patterns to the place of tile production.

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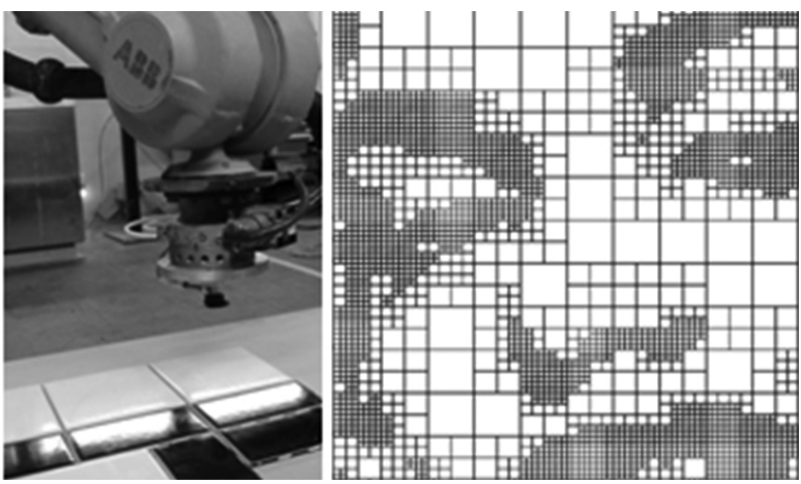

Figure 1: Complex tile patterns can be efficiently placed with low-cost computational and robotic tools