Professorship of Digital Fabrication
Department of Architecture
Technical University of Munich

Digital Fabrication Research Topic WS 2026/27

Designing with Reclaimed Inventory: Material-Informed Brickwork Reuse

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For students of the programs: Architecture, Civil Engineering, Robotics

Requirements: Interest in robotic fabrication, hands on physical prototyping; basic programming knowledge in Python or a visual programming language such as Grasshopper is helpful

Research Question: Designing with reclaimed inventory: how can material-informed allocation of reclaimed bricks generate new architectural expression?

Description: Conventional construction treats materials as uniform, standardised and abstract. Circular reuse cannot rely on this assumption. Every reclaimed element carries its own history of use, wear and damage, and has to be considered individually. This gives rise to a form-follows-availability paradigm, in which the reclaimed material inventory informs architectural expression, structural performance, mechanical behaviour and construction logic.

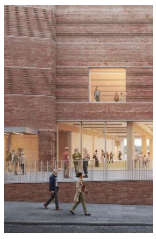
Building on precedents in brick reuse and material allocation (see References below), this project aims to design a pavilion from a reclaimed brick inventory in which the condition of every brick is known, with a focus on material loss and mortar exposure. This knowledge enables an informed allocation of each brick to realise an intended design, as shown in early studies (Fig. 1). Students are expected to further explore design strategies and allocation methods, and to identify the opportunities and challenges that arise. They will receive a synthetic reclaimed brick inventory, together with a computational tool for designing, allocating and rendering a brick assembly, and are expected to develop the methods further (Fig. 2).

Hands-on tests: Physical tests with real reclaimed bricks to evaluate how well the simulated computational methods transfer to reality. Bricks, mortar and tools will be provided.

Design and modelling: Further development of the computational allocation & mapping algorithms, and design of pavilion studies with renderings.

References:

Reuse: *David Chipperfield Architects, Nobel Center, Stockholm, Sweden, 2020 (left); Bricks in Common, AART, Denmark, 2023 (right).*
Form: *Serpentine Pavilion 2026 by LANZA atelier*
Application: *New Museum of Natural History Basel and State Archives, EM2N, Basel, Switzerland, 2014–2026, Van Driessche's House in Sint-Denijs-Westrem, 1973.*
Allocation & Mapping*: Fjordenhus by Olafur Eliasson, Denmark, 2009-18.*



Images:

Figure 1.

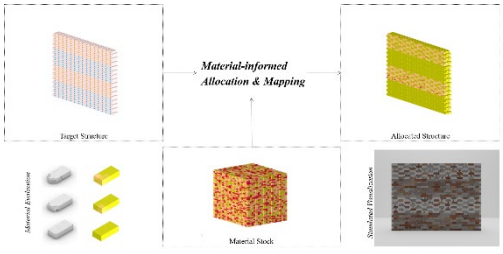


Figure 2.

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