

Digital Fabrication Research Topic WS 2026/27

The Secret Life of Urban Pigeons: 3D-Printed Ceramic Habitats for Population Management and Climate Adaptation in Munich

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For students of the programs: Architecture, Information Technologies for the Built Environment, Resource-efficient and Sustainable Building, Environmental Engineering, Civil Engineering

Requirements: Basic programming knowledge in Python or a visual programming language such as Grasshopper is helpful, but more important is the motivation to develop programming skills during the course. A basic understanding of climate simulation tools, e.g., the Ladybug Tools or Eddy3D plug-ins, is a plus.

Research Question: How can digital fabrication transform under-bridge spaces into better urban environments for both humans and animals?

Description: The goal of the research is to explore the design and fabrication of 3D-printed ceramic nesting elements for urban pigeons for potential integration into Munich's bridge infrastructure. The project addresses the challenge of creating controlled, species-appropriate nesting opportunities while improving the quality and acceptance of shared urban spaces for humans. It will also investigate how the elements can contribute to climate adaptation for both humans and animals, for example through wind reduction, shading, water retention, or sponge-city principles.

You will develop parametrically adaptable nesting elements that respond to the needs of pigeons as well as to climate requirements on site. Attention will be given to architectural and aesthetic integration, aiming to create solutions that are perceived as valuable design elements. Through an iterative design-to-fabrication process, you will develop and evaluate your concepts and gain first practical experience with ceramic 3D printing, translating computational designs into physical prototypes.



Images:

Rainerstraße Viaduct mural, Salzburg, Peter Krackowizer / reisemosaik.at (left)

TUM Digital Fabrication (right)

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