Preface

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On November 4, 2021, the symposium "Vision and Strategies for Reinforcing Additively Manufactured (AM) Concrete Structures" scientific network "Adaptive Reinforcement of Geometrically Complex Cementitious Shaped Structures" (DFG project number 326129619) was hosted at the Technical University of Dresden to conclude the funding period.

The aim of this network, which is funded by the German Research Foundation (DFG), was to increase the design freedom in the use of cementitious materials through the use of end-to-end digital processes.

The complexity of this task was reflected in the group of participants, which included architects and civil engineers as well as computer scientists and materials scientists.

In addition to its many positive properties, the cement material, which is important for architecture, has clear weaknesses, particularly in the transmission of tensile forces. Without the addition of reinforcement, the potential of the material is significantly limited. Processing in an automated process such as so-called 3D printing does not initially change this. Regardless of the design, economic and ecological advantages associated with AM processes, the mechanical properties may even deteriorate without the integration of reinforcement. The known reinforcement methods, i.e. the use of rods and mats, usually cannot be integrated into the automated processes. In order to be able to use the mentioned potentials nevertheless, new reinforcement methods have to be developed for this purpose.

During the symposium, various approaches, methods and materials were presented, as well as solutions for the complete elimination of reinforcement.