



Editorial

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Accepted: 24 November 2020 / Published online: 2 December 2020
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The Construction Robotics community has been conducting applied research and innovating to bridge the gap between design, engineering, and fabrication in factories and on construction sites. As a result, research and development in robotic applications has grown in complexity, evolving from linear flows to more responsive systems of simulation informed automation.

Linear parametric methods enable design models to generate mass customized fabrication information. However, this workflow is challenged by construction, where deviations between digital and physical realms require more adaptive approaches.

A responsive robotics approach gathers process data, simulates optimized solutions and re-informs construction actions. This data-informed approach leverages simulation systems as frameworks for more interactive, intelligent and dynamic approaches to automation. This issue of the Journal on Construction Robotics focuses on this research area to highlight the growing capabilities of robotics.

The articles chosen in the special issue on Modeling and Simulation in Construction Robotics detail an increasing digital ability to understand the world through simulation.

Simulation is used to improve construction in brick and stone applications from the robotic creation of constraint informed catenary vaults, to vision-informed onsite planning and stone stacking. This focus can be found in augmented interfaces for brick assembly as well as bidirectional connections between site conditions and stone carving systems.

Simulation is utilized in robotic timber construction processes from mixed reality interactions, to automation of intricate joinery. Its impact is demonstrated in the realization

of large scale pavilions which integrate automated production chains into full scale demonstrations that prove the potential of construction robotics.

These articles show how simulation is essential to improve the creation of spatial structures, to learn about material properties, to connect mobile robots in intelligent networks and to integrate mobile robot systems into applications which seek to evolve onsite construction processes.

These articles detail the wide range and scope of the construction robotics community while highlighting the shared ground of innovation upon which we are building automated construction technologies of the future.

Some of the research and development documented in this focus issue was originally submitted to the Robots in Architecture 2020 conference, postponed due to Covid19. We thank the Authors for continuing their research during these times of social distancing. We thank the Reviewers for their counsel, our Associate Editors for their guidance and our Editorial staff for their dedication.

We also thank you, the reader, for your continued interest. We hope this issue inspires you to explore new ideas, develop new solutions and share them with our growing Construction Robotics Community.

Stay Well,

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Funding Open Access funding enabled and organized by Projekt DEAL.

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