

Proceedings of the 2nd Future of Construction
Workshop at the International Conference on
Robotics and Automation (ICRA 2023)

Future of Construction: Robot Perception, Mapping, Navigation,
Control in Unstructured and Cluttered Environments

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Introduction

The \$10 trillion global construction industry has traditionally been a labor-intensive industry, yet it stands to benefit from autonomous robots that promise to deliver construction work that is more accurate and efficient compared to manual or conventional methods. However, the integration of automation and robotic technology into the construction workplace is faced with significant barriers including high cost of entry, safety concerns, inadequate training and knowledge about robotics, and poor performance of robots in dynamic, cluttered and unpredictable environments such as construction sites.

To tackle these challenging issues, this workshop aims to facilitate discussion on technology that will enable advanced robotics for future construction workplaces with an emphasis on robust perception and navigation methods, learning-based task and motion planning, and safety-focused robot-worker interactions. In line with the ICRA 2023 Embracing the Future: Making Robots for Humans theme, this workshop provided a venue for academics and industry practitioners to create a vision for robotics in construction work and ensure equitable participation in planning for the future of construction workplaces. The full-day workshop featured presentations by distinguished speakers from both industry and academia as well as interactive activities in the form of a SLAM challenge, poster sessions, debate, and panel discussions.

On June 2, 2023, the workshop was held as a hybrid event, with in-person activities as well as a synchronous Zoom session. This workshop solicited contributions in two tracks: (i) the Paper Track and (ii) the Poster-only Track. The Paper Track consists of contributed papers that constitute novel, original research in construction robotics or closely related fields. Whereas, the Poster-only track consists of posters that are based on a prior publication or on a paper that is concurrently submitted to ICRA or IROS 2023. The submitted contributions were individually reviewed by the organizing committee. In total, 15 papers and 9 posters were submitted to the workshop and 15 papers and 7 posters were accepted for presentation. 7 papers constitute first-time publications and are included in these proceedings. The authors of accepted papers and posters were invited to present their research at the poster session during the workshop. Three outstanding papers were selected to receive best research awards and were highlighted during the spotlight paper presentations. In addition, the video presentations of each paper were archived at our website: <https://construction-robots.github.io>.

We sincerely thank the speakers, authors, event hosts and everyone who has participated in this workshop. We hope that this effort will greatly contribute to the further advancement of construction robotics.

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