

Mehdi Tarkian, Johan Persson, Johan Ölvander & Xiaolong Feng
Linköping University & ABB Corporate Research
Contact: mehdi.tarkian@liu.se

modeFRONTIER User Meeting Abstract

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Multidisciplinary Design Optimization of Industrial Robots

The work includes a multidisciplinary design optimization framework for modular industrial robots. An automated design framework, containing physics based high fidelity models for dynamic simulation and structural strength analyses are utilized and seamlessly integrated with a geometry model.

The proposed framework utilizes well-established methods such as metamodeling and multi-level optimization in order to speed up the design optimization process. The contribution of the work is to show that by applying a merger of well-established methods, the computational cost can be cut significantly, enabling search for truly novel concepts.

In order to introduce industrial relevance, a modular industrial robot has been chosen as a design study. The chosen product is suitable as a proof of concept, since a holistic and multidisciplinary designs approach is required to find optimal solutions.