Popular science summary of the PhD thesis

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Title of the PhD thesis	Smart Manufacturing Frameworks
PhD school/Department	DTU Compute

Science summary

* Please give a short popular summary in Danish or English (approximately half a page) suited for the publication of the title, main content, results and innovations of the PhD thesis also including prospective utilizations hereof. The summary should be written for the general public interested in science and technology:

The construction industry has been plagued by low productivity for quite some time now. Automation is considered as a viable way forward to improve the situation. The industry has not witnessed proliferation of robotic technologies as seen in other fields like manufacturing due to high levels of project specificity, smaller lot sizes for production and need for customization, thus causing the sector to remain vastly under-served.

In this work, we focus on developing a software framework (Sculptor), which will help the industry to rapidly design, prototype, develop, and test robotic applications. An application is said to be understood as a cyber-physical system which contains one or more robotic manipulators equipped with necessary end-effectors and a tablet-based interface to help a novice user to easily program the system.

Architects find it convenient to express such robotic processes using parametric (data flow) models. These models come with some known drawbacks related to stability, maintainability, latency, and re-usability. After having developed Sculptor, we are trying to address some of the above stated problems by applying methods like software design patterns. Further, the framework was used to develop multiple commercial applications to evaluate its effectiveness.

Please email the summary to the PhD secretary at the department