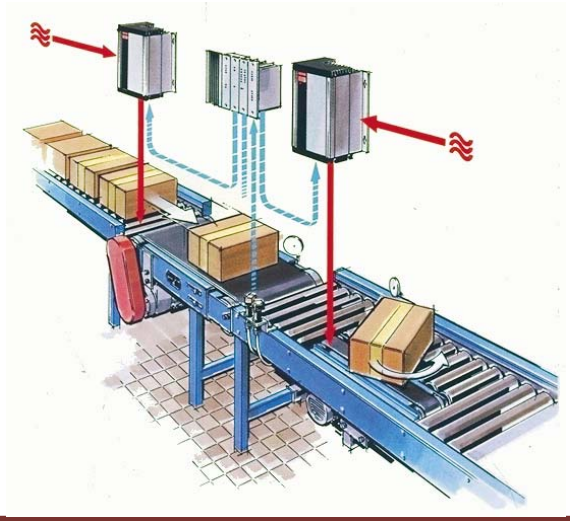

Architectures for Online Reconfiguration and Fault Tolerant Control (FTC) in Embedded Systems.

Project Period:
2000-2004

Ph.D. student:
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Funding:
Co-financed by Danfoss Drives, DK

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The Ph.D. project focus on software architecture for fault tolerant control of frequency converters. A frequency converter is an electronic device for controlling the speed of a three-phase induction motor. Fault tolerant control is an approach, where fault tolerance is achieved solely by reconfiguration of existing control algorithm software and hardware.

A software architecture analysis of the existing control loop program code architecture has been conducted and a program code architecture called the sandwich code file structure comprising three levels has been developed. The purpose is to keep control algorithm program code in the middle of the sandwich stable towards changes in environment throughout the development process. It's a redesign where some architectural variation points such as calculation with fixed point numbers were moved to the upper part of the code sandwich and other variation points such as adaptations of the control algorithm to execution and simulation environments in the form wrappers were confined to the lower part of the code sandwich. This architecture offers several improvements to the engineering process in development of control loop functionality.

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