

## **CIM SYSTEM EXPANSION WITH MINIMAL CHANGES TO INSTALLED SOURCE CODE**

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The need to upgrade the CIM (Computer Integrated Manufacturing) Systems to provide increased capability in the face of rapid change in product/process specifications has been identified: integration of mechatronic devices such as CNC machines, robot manipulators, automatic assembly systems is a major effort in manufacturing and automation systems, particularly in the face of an increasing demand for these systems to be agile. Agility implies the capability of responding to production changes, both in volume and variety, rapidly, effectively and reliably with low cost.

Due to differences in user interfaces to these equipment significant recoding is often needed in response to changes required in production systems. The code that can run into thick volumes has to be verified before installation. Hence, modifying the installed control software to facilitate extension or modification of the system to suit current needs is not straight forward.

The present problem is to provide a suitable framework which would facilitate such extension and improvement. In the proposed approach, we wrap already installed software modules in CGI script thus making it possible for them to cooperate with new control modules. The system control is designed and specified using the Universal Modelling Language (UML). In order to provide re-configurability we define port structures between each pair of communicating classes. Verification is localised by having to verify a module using only the information contained in the ports to which it is connected.

