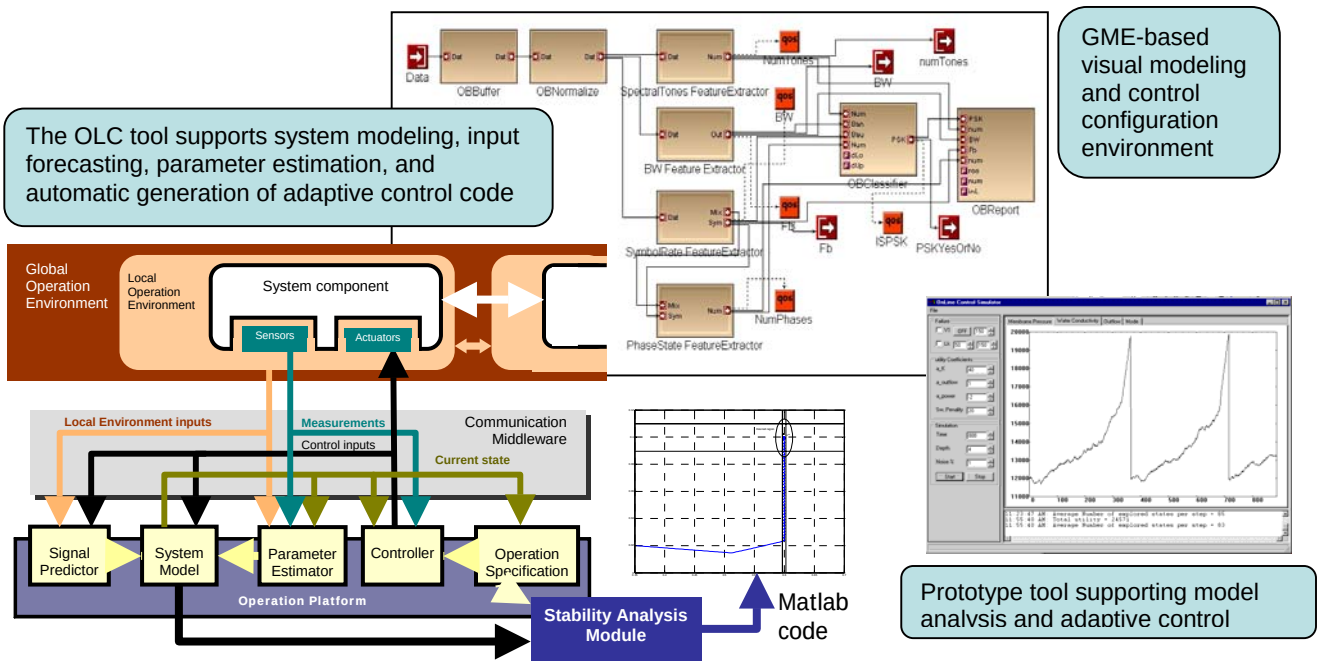
OLC: Online Limited Lookahead Supervisory Control
A Tool for Adaptive Control of Embedded Systems[1]
Summary of Features

Embedded computation systems are typically composed of software components integrated with physical processes. Due to their complex nature traditional control and decision support techniques cannot be applied directly to such systems. The OLC tool implements a novel approach to automatically handle the control requirements. The tool employs a concrete and efficient limited lookahead control techniques to drive the system to the desired domain of operation as specified by the user.

The limited lookahead control approach is applicable to various performance and resource management problems, from those with simple dynamics to more complex ones, including hybrid event-driven systems and those with long delay or dead times. In addition, it can accommodate changes to the system structure and parameters, caused by internal failures or run-time changes to the system specifications. The underlying control structure is easy to integrate with health monitoring and management components to form a fault adaptive control structure. In addition, the tool provides an automated feasibility testing module that can provide precise estimation of the accuracy of the limited lookahead control procedure. The figure below shows the main components of the OLC tool.



The OLC tool suite has the following components:

- A modeling tool (DQME) that allows creating, editing, and maintaining system models and specification requirements. This tool is based on GME; an independently maintained and supported tool from ISIS.
- Software code generators that translate system model and specification into executable control code (including necessary input forecasting modules) that could be deployed on an embedded system.
- Design time support code that implements the algorithms for stability and accuracy analysis of the system with respect to the given operational requirements.

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