



## Description

Argo/UML is an object-oriented design and analysis tool that provides cognitive support to help designers make better designs. Most commercial CASE tools provide strong support for code generation but leave the entire burden of decision-making to the designer. In contrast, Argo/UML provides features that help designers make better design decisions, keep track of pending decisions, and better visualize design issues.

## Applicability

Argo/UML is relevant to software developers using the Unified Modeling Language for object-oriented design. Argo/UML supports use case, class, and state diagrams. Argo/UML is implemented in Java. Argo's cognitive support infrastructure can be customized and applied to other design domains.

## Features and Benefits

- ◆ Design critics help catch design errors immediately, improve design decisions, and reduce rework.
- ◆ Design checklists help resolve common design problems early, and make design reviews more effective.
- ◆ Argo's "to do" list manages feedback from critics without disrupting the designer's train of thought.
- ◆ Navigational perspectives define alternative views of the design that make specific design issues visible.
- ◆ Design history tracks criticism and resolutions.
- ◆ Strict adherence to UML and the XMI file format leverage widely available commercial tools and training.
- ◆ Customization features help adapt Argo to your organization's practices.

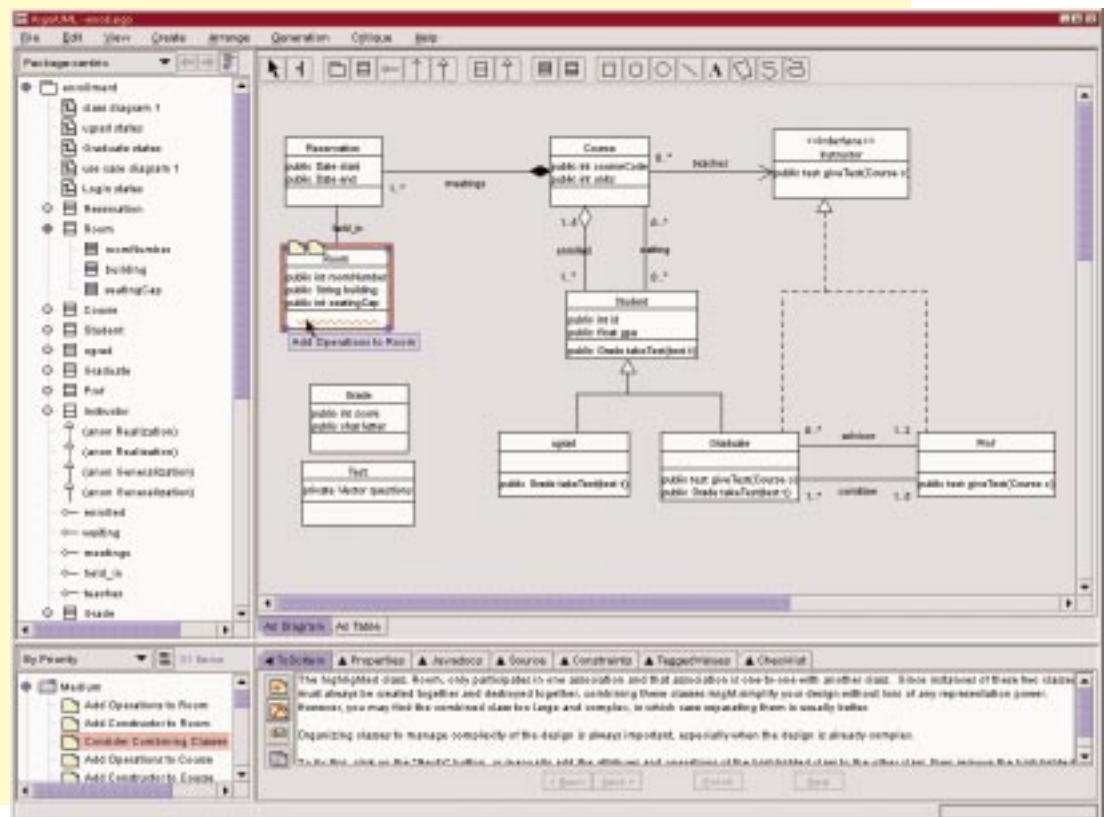
# Argo/UML provides cognitive support for object-oriented design

Designers use Argo/UML much like they would use other object-oriented design tools: they place class, state, and use case icons in diagrams and draw relationships between them (upper right).

Argo's navigation pane (upper left) can present several alternative hierarchical views on the design. Each navigational perspective is intended to highlight a particular design issue.

While designers work, design critics analyze the design and provide helpful advice. The "to do" list (lower left) presents and organizes advice about pending design changes.

When the designer selects a "to do" item, the problematic part of the design is highlighted and information about the problem and a potential solution is displayed (lower right). Some critics offer to automatically fix the identified problem. Toolbar buttons allow the designer to enter personal reminders, dismiss the current item, send email to the critic's author, or hush the critic.



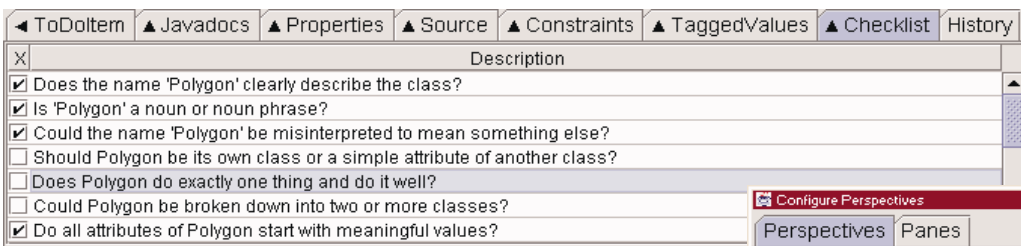
## Design Critics

Design critics continuously analyze the design as the designer works and suggest possible improvements. These suggestions include indications of syntax errors, reminders to return to unfinished areas, style guidelines, and advice from experts. Many critics offer to automatically make improvements. Critics are controlled to be relevant and timely to the design task at hand. Critics never interrupt the designer, instead they post their suggestions to the designer's "to do" list. Argo supports the following critiquing process:



## Design Checklists

Many development organizations conduct design reviews using checklists of common problems. Argo/UML helps designers work through these checklists beforehand to focus design review effort. Unlike paper-based checklists, Argo's checklists are filtered and customized to specific design elements. ▼



## "To Do" List

Designers must keep track of all the myriad details of their task. They often skip steps in the design process, leave parts of the design unspecified, or make mistakes that require revision. Argo's "to do" list presents these action items in an organized form. These items can be suggestions from critics or personal reminders entered by the designer.

## Navigational Perspectives

UML defines eight different diagram types, each of which addresses a different set of design issues. Argo adds a rich set of alternative tree-structured views of the project, and provides a simple traversal rule language for designers to customize those perspectives or add new ones. ►

## Design History

A design change that fixes one design problem often introduces another. Designers can make more informed trade-offs when they understand how the design reached its current state. Argo keeps a history of all criticisms raised and how they are resolved.

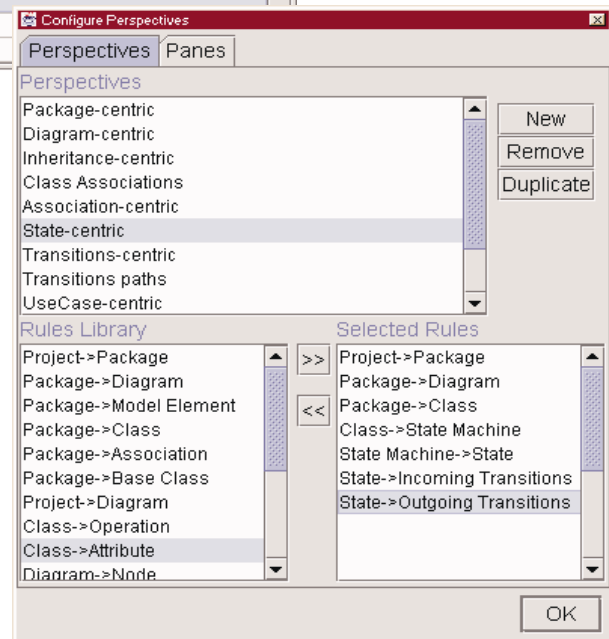
## Unified Modeling Language

UML is a new standard object-oriented design notation that consolidates and simplifies the current leading methodologies: Booch, OMT, and OOSE. UML use case diagrams identify relationships between system users and system functions. Class diagrams describe class inheritance and associations. State diagrams specify the object behavior. Argo follows the UML standard closely.

## Customization

Critics and checklists are written in Java and can be easily authored or modified to suit the needs of a particular organization. Each critic contains the email address of its author

so that practicing designers can discuss the critic's advice with the expert who provided it.



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### Freely Available Software

Information about the architecture group, as well as its software, is freely available on the Web or by anonymous FTP:

<http://www.ics.uci.edu/pub/arch/>  
<ftp://www.ics.uci.edu/pub/arch/>

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