

**Project 4:**

Tool-assist software architecture design argumentation

**Description:**

Decision making and argumentation in software design can be traced back to the 70's and 80's. Methods such as IBIS, QoC and DRL were proposed then to identify issues and capture design arguments. IBIS (Issue Based Information System) guides the identification, structuring, and settling of issues raised by problem-solving groups. In the last decade, much research in this area have focused on capturing and modelling design rationale. There is a general belief that the existence of design rationale helps design argumentation.

However, human designers can suffer from cognitive biases and other factors that influence judgments. So the existence of design rationale does not necessarily lead to a logical design. Additionally, it has been found that humans are not very good at making judgments when faced with uncertain premises. Their judgments can often be biased by their evaluation of the likelihood of premises.

In this study, we shall construct a tool to allow us to research into software design argumentation. The tool shall capture conditional argumentation in a form that allows designers to review and evaluate their logicity. An example of a conditional software design argument might be: If user experience is important and graphics enhances user experience, then we should incorporate graphics in our user interface.

1. User experience is important (high probability)
2. Graphics enhances user experience (unknown probability)

Evaluate conclusion: we should incorporate graphics in our user interface

There are two objectives in constructing this tool. First, it allows us to capture conditional design argumentation in its basic forms, i.e. modus ponens, denial of antecedent and confirmation of consequent; second, it allows us to compare how designers evaluate argumentation with and without this framing effect. That is, would designers provide more logical design argumentation if they use such a tool?

**Supervisor:**

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**Requirements:**

A student is required over summer to build such a tool. The tool shall be built in Java to capture argumentation and likelihood of premises and conclusions, in terms of probability. The student is required to test this tool using software design arguments with developers.