What's in a Name? Linear Temporal Logic Literally Represents Time Lines

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Abstract

Linear Temporal Logic (*LTL*) is widely used to specify requirements in safety-critical systems. However, like many formal verification techniques, it is known to be unintuitive and error-prone for human practitioners to specify and validate. In this paper, we provide a new timeline tool for visualizing *LTL*-based specifications, which is effective at intuitively representing a wide range of formulas. Our tool generates timeline visualizations by translating *LTL* formulae to intermediate representations as Büchi automata and then ω-regular expressions, and finally simplifying and visualizing the expressions. We provide an algorithm for this visualization, a theoretical soundness analysis, and an implementation.

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1. Introduction

Requirement specification is a central step in the development of safety-critical systems. As a first step, requirements are typically written in natural language. For example, here is a real-world requirement specification from an air traffic control system [1]

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