

Visualization of Aho Corasick Algorithm Using Z-eves and Petri Net

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Abstract

In molecular biology, DNA sequence matching is one of the most crucial operations. The challenges of *similarity search* in a large size of *DNA* databases inspire the development of searching and matching techniques. Inspired by recent work in DNA sequence search, we have developed such a model for visualized the matching process. Z and Petri Net are two languages of model-based specification techniques. Z is used to define tokens, labels and constraints of the system and Petri nets are used to specify the overall structure, control flows, causal relation, and dynamic behavior of a system. Z structured as a set of schemas with box-like structures that introduce variables and the relationships between these variables are formally stated. To verify the correctness of the specifications, a tool called Z-eves can be used. Petri Nets represent the structure of workflow systems in the form of graph. Tokens are used in these nets to visualize, simulate the dynamic and concurrent activities of systems. This paper will discuss regarding the visualization of Aho-Corasick algorithm using Z specification and Petri Nets.

Keywords: Software Engineering, Formal Methods, Z Specification Language, Petri Net, similarity string matching

1. Introduction

Software engineering is a systematic and disciplined application to develop software. On the whole, software engineering is an engineering discipline that is concerned with all aspects of software production [1]. Software products consist of developed programs and associated documentation. A software development process is a structure imposed on the development of a software product. There are three major models of development process includes waterfall model, v-model and spiral model. The models consist of related activities performed accordingly to produce software. General activities are specification, design and implementation, validation and evolution. In part of those models, software specification is the process that establishing what services are required and the constraints on the system's operation and development.