



The GTB and PAT tools

Adrian Johnstone¹ Elizabeth Scott² Giorgios Economopoulos

*Department of Computer Science
Royal Holloway, University of London
Egham, Surrey, United Kingdom*

Abstract

The Grammar Tool Box is a toolset for manipulating Context Free Grammars and objects associated with them such as parsers, languages and derivations. GTB has three main rôles: as a pedagogic tool; as an experimental platform for novel algorithms and representations; and as a production tool for translator front end generation. In this tool demonstration we give an overview of GTB and its companion Java-based animator tool PAT.

Keywords: Parsing, software animation

GTB is an environment for manipulating grammars and producing automata and parsers from them. Most of our experimental work with GTB has focussed on the development of novel GLR parsing algorithms [4,3] and their comparison with existing algorithms, in particular that of Farshi [1].

We use the following grammar to highlight performance aspects of the algorithms:

```
SS ::= S.  
S  ::= T 'b'.  
T  ::= A 'b' | T T T.  
A  ::= T 'b' A A A | T T 'b' | #.
```

GTB can output intermediate structures in a form suitable for visualisation with the VCG tool [2], but for many applications a dynamic animation is desirable. PAT is a parser animator which takes tables exported from GTB; constructs parse-time objects such as GSS's and SPPF's and then displays the

¹ Email: a.johnstone@rhul.ac.uk

² Email: e.scott@rhul.ac.uk

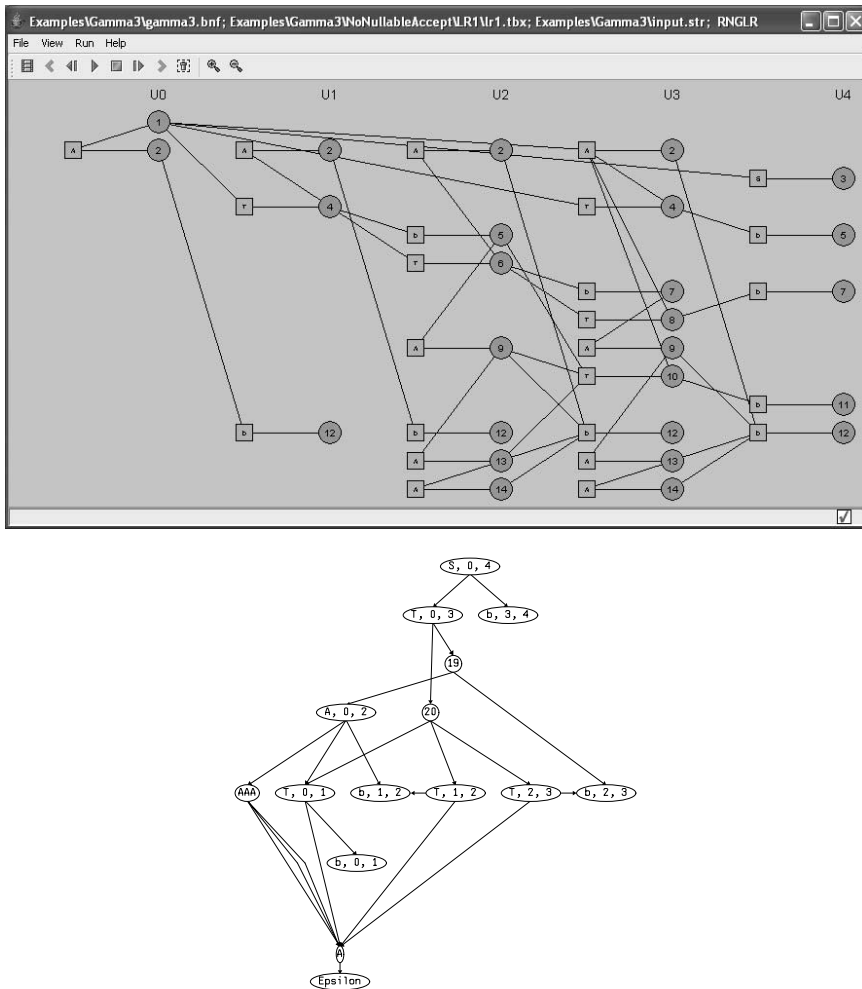


Fig. 1. GSS animation in PAT and equivalent VCG rendition

results. The user can interactively go backwards and forwards in time to see the way in which these structures are built up. We shall demonstrate animations of Earley, Farshi, LR(1) RNGLR and BRNGLR algorithms: Figure 1 shows the output from an RNGLR parse of the above grammar.

References

- [1] Rahman Nozohoor-Farshi. GLR parsing for ϵ -grammars. In Masaru Tomita, editor, *Generalized LR parsing*, pages 60–75. Kluwer Academic Publishers, Netherlands, 1991.
- [2] Georg Sander. *VCG Visualisation of Compiler Graphs*. Universität des Saarlandes, 66041

Saarbrücken, Germany, February 1995.

- [3] E.A. Scott, A.I.C. Johnstone, and G.R. Economopoulos. BRN-table based GLR parsers. Technical Report TR-03-06, Royal Holloway, University of London, Computer Science Department, 2003.
- [4] Elizabeth Scott, Adrian Johnstone, and Shamsa Sadaf Hussain. Tomita-style generalised LR parsers. Technical Report TR-00-12, Royal Holloway, University of London, Computer Science Department, December 2000.