

# Online Visualization of Traditional Quranic Grammar using Dependency Graphs

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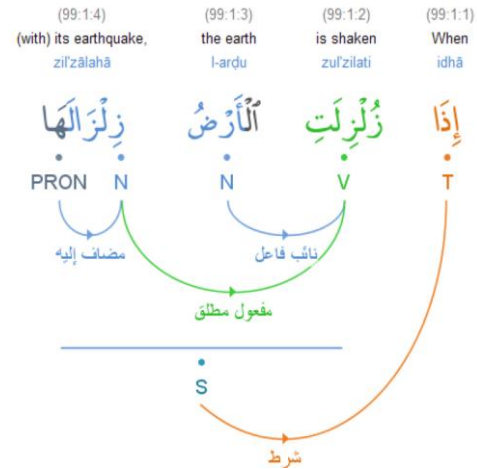
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## ABSTRACT

In this paper we discuss a novel approach to represent traditional Arabic grammar visually through dependency graphs which are modern tools to represent the syntax of languages (see the figure below). It has been indicated that this modern technique has been inspired by the traditional Arabic grammar syntax [Kruijff 2006]. Through these dependency graphs we manage to render Arabic grammar relations in a graphical and machine readable form. We have applied this technique to build an online resource called “The Quranic Arabic Treebank” (<http://corpus.quran.com/treebank.jsp>) [Dukes et al 2010]. This is a recently developed research project organized at the University of Leeds and has been a free and popular study resource used by thousands of Arabic students and Quranic researchers worldwide. For every verse in the Quran, a detailed morphological explanation is given of [Dukes and Habash 2010]. Furthermore, work is in progress to complete the syntax description of the entire Quran in terms of historical traditional grammar (إعراب القرآن الكريم) [Dukes and Buckwalter 2010]. We report on how representing the *i'rāb* of the Quran using dependency graphs inspired by traditional syntactico-semantic relations leads to a study resource more easily understood by modern students. Our graphical representation is capable of representing various traditional *i'rāb* relations between words as well as clauses such as elision (حذف)

and reconstruction (تقدير), etc. Accuracy is ensured through online collaboration, where multiple Arabic linguists and expert Quranic researchers review and discuss the resource, comparing against several traditional sources of *i'rāb* to verify morphological and syntactic analyses. We argue that computational methods can complement more traditional approaches to historic Arabic grammar, and aid modern linguists through new visualization and online grammatical search tools. Moreover, these graphical representations can be processed by computational linguistic tools where further interesting applications can be built.



## Reference

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