Lexicon-Grammar Web

Jorge Baptista[1,2], **David Antunes**[1], **Nuno Mamede**[1], **and Eugénio Ribeiro**[1,3]
[1] INESC-ID Lisboa, Portugal
[2] Faculdade de Ciências Humanas e Sociais, Universidade do Algarve, Portugal
[3] Instituto Universitário de Lisboa (ISCTE-IUL), Portugal
{jorge.baptista,david.f.l.antunes,nuno.mamede,eugenio.ribeiro}@inesc-id.pt

Abstract

This demo showcases a web-based interface that provides open, interactive access to a large-scale grammatical database of European Portuguese verbal constructions. Through a unified search and exploration environment, users can query, inspect, and compare more than 7,000 distributionally free verbal constructions and over 2,700 verbal idioms (frozen constructions), grounded in long-standing Lexicon–Grammar descriptions. For each construction, the interface exposes core linguistic properties such as argument structure, distributional constraints, semantic roles, major syntactic transformations, and curated usage examples with English translations. The demo illustrates how detailed, manually validated grammatical knowledge can be explored dynamically via the web, supporting linguistic research, language teaching, and NLP development. To the best of our knowledge, this is the largest publicly accessible, web-based grammatical resource dedicated to European Portuguese verbal constructions.

1 Overview: Web Interface and Resources

The resources presented in this demo originate from long-term research of European Portuguese within the Lexicon–Grammar framework (Gross, 1996), with a strong orientation toward computational processing. The description of distributionally free verbal constructions stems from the systematic development of a Lexicon–Grammar of EP verbs, leading to the creation of the VIPER database (Baptista, 2013). This work resulted in a large, manually curated inventory of verb constructions, later consolidated in the *Dicionário Gramatical de Verbos do Português Europeu* (Baptista and Mamede, 2020). The corresponding web-accessible resource is made available through the STRING NLP chain (Mamede et al., 2012)[1] and the PORTULAN/CLARIN research infrastructure[2].

The VIPER resource encodes the +7,000 most frequently used EP verbal constructions. The information represented includes: (i) basic syntactic structure (e.g. impersonal, intransitive, transitive, ditransitive, and transitive–predicative patterns), covering more than 70 formal classes; (ii) explicit argument structure and distributional constraints, including human vs. non-human noun distinctions and over 70 semantic features corresponding to semantic prototypes (Bick, 2009); (iii) semantic roles selected from a set of approximately 50 highly reproducible constructs (Talhadas et al., 2013); (iv) constraints on subclause modality (indicative, subjunctive, factive, and *se*-interrogative) and coreference; and (v) major syntactic transformations, including several passive types, pronominalization and restructuring processes, symmetry constructions (Baptista, 2005), intrinsically reflexive constructions (e.g. *queixar-se* 'complain'), and *verba dicendi* constructions (Baptista, 2010). Each entry is illustrated with a canonical example and its English translation, complemented by manually curated corpus and web-based examples. Fig. 1 illustrates (a) the Search view of the VIPER and (b) the entry view of verb *agradar* 'please' (class 05).

The VIPER database has supported several NLP tools and linguistic studies integrated into the STRING system, including work on EP verb sense disambiguation (Pires, 2016), a survey on EP communication predicates (Reis et al., 2021), a study on transitive–predicative constructions (Baptista, 2021), and contrastive studies of locative verbs in European and Brazilian Portuguese (Rodrigues et al., 2015). It also serves as the catalogue of verbal senses for a lexicalized Abstract Meaning Representation initiative (Baptista et al., 2024). Together, these studies highlight the relevance of de-

[1] https://string.hlt.inesc-id.pt/

[2] https://hdl.handle.net/21.11129/0000-000D-F91E-A

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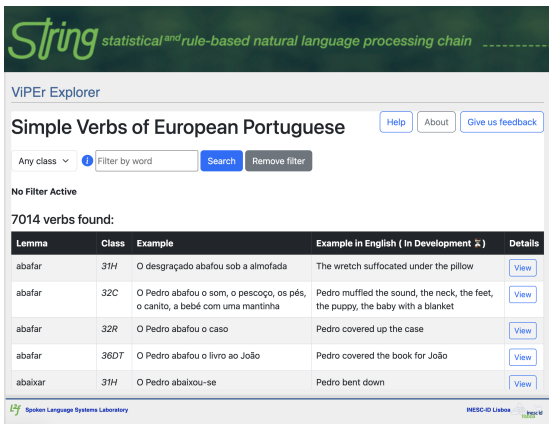
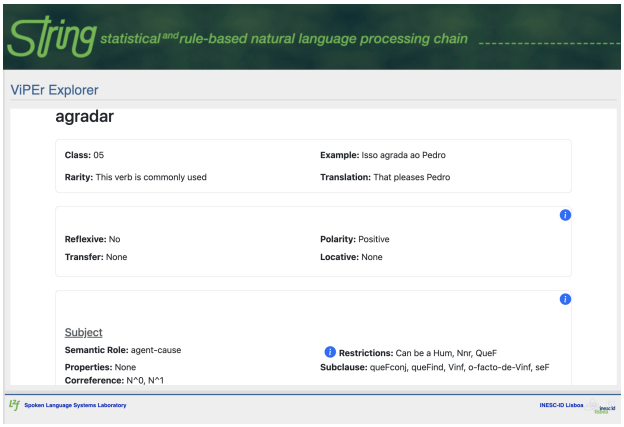


(a) Search view



(b) Entry view

Figure 1: VIPER web interface.

tailed lexical–syntactic descriptions for both theoretical investigation and applied NLP research, now made openly accessible through the web interface presented in this demo.

While grammatical descriptions of verbal constructions exist for both major varieties of Portuguese, many are available only in hard-copy form (Busse, 1994; Cançado et al., 2013) or as downloadable datasets primarily targeting Brazilian Portuguese, such as VERBNET.BR (Scarton, 2011) or VaLexPB[3]. In contrast, few resources for European Portuguese are manually curated, natively developed for EP, and provide comparably fine-grained linguistic descriptions in a web-accessible format.

In parallel, a second resource (VIDIOM) focusing on +2,700 verbal idioms has been developed. Verbal idioms are elementary sentences in which the verb and at least one of its arguments are distributionally frozen and the overall meaning is often non-compositional, that is, it is different from the meanings of the individual elements taken in isolation (e.g., *bater a bota*, lit. 'beat the boot', meaning 'to kick the bucket / die'). Fig. 2 shows the (a) the Search view, for a query with verb *bater* 'beat', and (b) the Entry view of the verbal idiom *bater a bota* 'die'. This work builds upon earlier, formal linguistic descriptions of frozen sentences in Portuguese, and has been progressively extended to support computational processing (Baptista et al., 2014). Recent developments include the integration of verbal idioms into rule-based parsers (Galvão et al., 2019), the creation of a corpus annotated for verbal idioms (Antunes et al., 2025b)[4], and dedicated methods for their automatic processing (Antunes et al., 2025a).

2 System Design

The system is implemented as a lightweight web application with a clear separation between data storage, backend logic, and user interface. The data layer relies on a SQLite relational database populated from structured spreadsheet sources and accessed through SQLAlchemy. The backend is implemented in Python using Flask, with modular routing via blueprints and server-side rendering through Jinja2 templates. The frontend consists of server-rendered HTML enhanced with Bootstrap components, enabling responsive layouts and interactive elements without reliance on a heavy client-side framework.

3 What the demo shows

The demo provides interactive access to the Lexicon–Grammar resources via a unified web interface. Users can search and browse verbal constructions, examine their syntactic and semantic properties, and compare distributionally free constructions with verbal idioms, illustrated by curated examples and English translations to support analysis.

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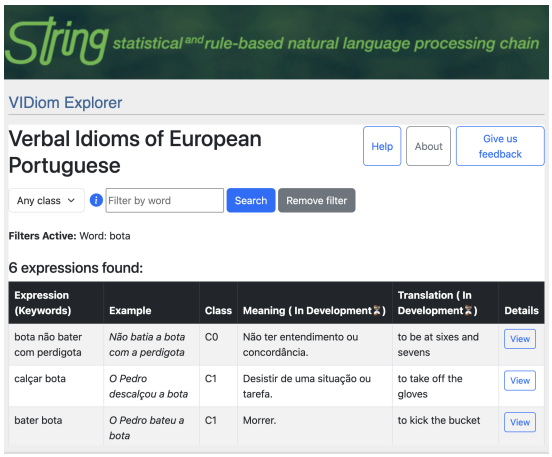
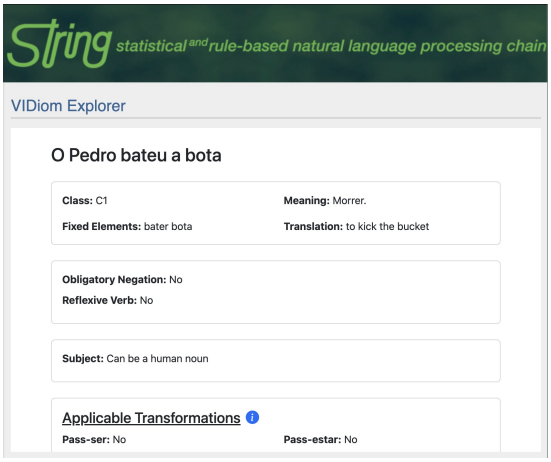
[3] https://github.com/jessemourao/VaLexPB/

[4] https://portulanclarin.net/repository/browse/vidiom-pt/



(a) Search view



(b) Entry view

Figure 2: VIDIOM web interface.

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