

13th Symposium on Languages, Applications and Technologies

SLATE 2024, July 4–5, 2024, Águeda, Portugal

Edited by

Mário Rodrigues

José Paulo Leal

Filipe Portela



Editors

Mário Rodrigues 

IEETA, ESTGA, University of Aveiro, Portugal
LASI – Intelligent System Associate Laboratory, Portugal
mjfr@ua.pt

José Paulo Leal 

Faculty of Sciences, Universidade do Porto, Portugal
CRACS – INESC TEC, Porto, Portugal
zp@dcc.fc.up.pt

Filipe Portela 

Centro Algoritmi, Escola de Engenharia, Universidade do Minho, Guimarães, Portugal
cfp@dsi.uminho.pt

ACM Classification 2012

Theory of computation → Formal languages and automata theory; Computing methodologies → Natural language processing; Information systems → World Wide Web

ISBN 978-3-95977-321-8

Published online and open access by

Schloss Dagstuhl – Leibniz-Zentrum für Informatik GmbH, Dagstuhl Publishing, Saarbrücken/Wadern, Germany. Online available at <https://www.dagstuhl.de/dagpub/978-3-95977-321-8>.

Publication date

November, 2024

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at <https://portal.dnb.de>.

License

This work is licensed under a Creative Commons Attribution 4.0 International license (CC-BY 4.0): <https://creativecommons.org/licenses/by/4.0/legalcode>.



In brief, this license authorizes each and everybody to share (to copy, distribute and transmit) the work under the following conditions, without impairing or restricting the authors' moral rights:

- Attribution: The work must be attributed to its authors.

The copyright is retained by the corresponding authors.

Digital Object Identifier: 10.4230/OASlcs.SLATE.2024.0

ISBN 978-3-95977-321-8

ISSN 1868-8969

<https://www.dagstuhl.de/oasics>

OASlcs – OpenAccess Series in Informatics

OASlcs is a series of high-quality conference proceedings across all fields in informatics. OASlcs volumes are published according to the principle of Open Access, i.e., they are available online and free of charge.

Editorial Board

- Daniel Cremers (TU München, Germany)
- Barbara Hammer (Universität Bielefeld, Germany)
- Marc Langheinrich (Università della Svizzera Italiana – Lugano, Switzerland)
- Dorothea Wagner (*Editor-in-Chief*, Karlsruher Institut für Technologie, Germany)

ISSN 1868-8969

<https://www.dagstuhl.de/oasics>

■ Contents

Preface	
<i>Mário Rodrigues, José Paulo Leal, and Filipe Portela</i>	0:vii
List of Authors	
.....	0:ix
Committees	
.....	0:xi

Papers

Using Embeddings to Improve Named Entity Recognition Classification with Graphs	
<i>Gabriel Silva, Mário Rodrigues, António Teixeira, and Marlene Amorim</i>	1:1–1:11
Contributions to Legal Document Summarization: Judgments from the Portuguese Supreme Court of Justice	
<i>Margarida Rebelo Dias, Ricardo Ribeiro, and H. Sofia Pinto</i>	2:1–2:14
Ontology Visualization Tools: A Bibliographic Review and a Proposal	
<i>Ezra Gomes Marques, Cristiana Araújo, and Pedro Rangel Henriques</i>	3:1–3:14
Early Findings in Using LLMs to Assess Semantic Relations Strength	
<i>André Fernandes dos Santos and José Paulo Leal</i>	4:1–4:9
Experimental Comparison of the Effectiveness and Error Rates of Projectional and Text Editors	
<i>Tomáš Petro and Jaroslav Porubán</i>	5:1–5:9
Automatic and Dynamic Visualization of Process-Based Concurrent Programs	
<i>Daniel Augusto Rodrigues Farina, Rodrigo Campiolo, José Rufino, and Maria João Varanda Pereira</i>	6:1–6:12
Upgrade of Lark Compiler Generator to Support Attribute Grammars	
<i>Daniel Faria, Tiago João Baptista, and Pedro Rangel Henriques</i>	7:1–7:16
DrumLace – A Domain Specific Language (DSL) for Drum Programming	
<i>André Semanas de Oliveira Araújo, José João Dias de Almeida, and Pedro Rangel Henriques</i>	8:1–8:9
ERPL: DSL for Escape Rooms	
<i>Tiago Luís Dias da Silva and José João Almeida</i>	9:1–9:8
Towards an Intelligent Algorithm for Profile Authentication and Identification	
<i>Nuno Jerónimo, Filipe Portela, and Henrique Santos</i>	10:1–10:14
A Language for Explaining Counterexamples	
<i>Ezequiel José Veloso Ferreira Moreira and José Creissac Campos</i>	11:1–11:14



Anomaly Detection in Logs: A Comparative Analysis of Unsupervised Algorithms <i>Alysson C. E. de Moura, Geraldo P. Rocha Filho, Marcos F. Caetano, João J. C. Gondim, Aleteia Araujo, Marcelo A. Marotta, and Lucas Bondan</i>	12:1–12:14
Infrastructural Challenges and Good Practices in a Security Operation Center <i>Dimitri Alexandre da Silva, José Luís Costa, and João Rafael Almeida</i>	13:1–13:12
A Study of Security Issues of Eduroam Networks in Portugal <i>Luís Miguel Batista, Hélder Gomes, and João Rafael Almeida</i>	14:1–14:14

■ Preface

This book of proceedings compiles the accepted papers for the Thirteenth edition of the Symposium on Languages, Applications and Technologies, SLATE'2024.

SLATE traditionally covers three facets of the languages materialized in the three conference tracks: Human to Human Languages (HHL), Human to Computer Languages (HCL), and Computer-to-Computer Languages (CCL)

The tracks are addressing several applications of the languages for controlling or generating explanations of complex processes, machine learning applied to languages processing, code generators and parsers. In this thirteenth edition the application fields maintained the more traditional areas and added new application domains such as cybersecurity. Regarding the technologies used, Large Language Models (LLM) are now present on some research papers, and they are likely to be even more pervasive in the next SLATE editions.


We want to thank the many people without whom this event would not be possible: all the Members of the Scientific Program Committee for the careful review the submissions, contributing with corrections and new ideas, and helping on deciding the final list of accepted paper; the members of the Organizing Committee, for the help on dealing with the bureaucratic issues; the Invited Speakers Marcos Garcia and Alberto Simões for accepting our invitation to share their knowledge, the track chairs José Paulo Leal (HLC) and Filipe Portela (CCL) for their insightful inputs; and thank all Authors for their valuable contributions to SLATE with their current projects and research problems, that inspires all for further addressing challenges related to languages, either as the issue to be solved or as the solution to better addressing a challenge.


I wish you enjoy your reading,


Mário Rodrigues
SLATE 2024 general chair




■ List of Authors


José João Almeida  (9)
Algoritmi, LASI, Departamento de Informática,
Universidade do Minho, Braga, Portugal

João Rafael Almeida  (13, 14)
DETI/IEETA, LASI,
University of Aveiro, Portugal

Marlene Amorim  (1)
GOVCOPP, DEGEIT,
University of Aveiro, Portugal


Aleteia Araujo  (12)
Department of Computer Science, University of
Brasília (UnB), Brazil


André Semanas de Oliveira Araújo (8)
ALGORITMI Research Centre/LASI – DI,
University of Minho, Braga, Portugal

Cristiana Araújo  (3)
ALGORITMI Research Centre/LASI – DI,
University of Minho, Braga, Portugal


Tiago João Baptista (7)
ALGORITMI Research Centre/LASI – DI,
University of Minho, Braga, Portugal

Luís Miguel Batista (14)
DETI/IEETA, LASI,
University of Aveiro, Portugal

Lucas Bondan  (12)
Rede Nacional de Ensino e Pesquisa (RNP),
Brasília, Brazil;
Department of Computer Science,
University of Brasília (UnB), Brazil


Marcos F. Caetano  (12)
Department of Computer Science,
University of Brasília (UnB), Brazil


Rodrigo Campiolo (6)
Federal University of Technology – Paraná,
Brazil


José Creissac Campos  (11)
Universidade do Minho, Braga, Portugal;
INESC TEC, Braga, Portugal

José Luís Costa (13)
DETI/IEETA, LASI,
University of Aveiro, Portugal


Dimitri Alexandre da Silva (13)
DETI/IEETA, LASI,
University of Aveiro, Portugal

Tiago Luís Dias da Silva  (9)
Departamento de Informática,
Universidade do Minho, Braga, Portugal

José João Dias de Almeida  (8)
ALGORITMI Research Centre/LASI – DI,
University of Minho, Braga, Portugal


Alysson C. E. de Moura  (12)
Department of Computer Science,
University of Brasília (UnB), Brazil


Margarida Rebelo Dias (2)
Iscte – Instituto Universitário de Lisboa,
Lisbon, Portugal;
INESC-ID Lisboa, Lisbon, Portugal

André Fernandes dos Santos  (4)
CRACS & INESC Tec LA / Faculty of Sciences,
University of Porto, Portugal


Daniel Faria (7)
ALGORITMI Research Centre/LASI – DI,
University of Minho, Braga, Portugal


Daniel Augusto Rodrigues Farina (6)
Polytechnic Institute of Bragança, Portugal;
Federal University of Technology – Paraná,
Brazil


Geraldo P. Rocha Filho  (12)
Department of Computer Science, State
University of Southwest Bahia (UESB),
Vitória da Conquista, Brazil

Hélder Gomes  (14)
ESTGA/IEETA, LASI,
University of Aveiro, Portugal

João J. C. Gondim  (12)
Department of Computer Science,
University of Brasília (UnB), Brazil

Pedro Rangel Henriques  (3, 7, 8)
ALGORITMI Research Centre/LASI – DI,
University of Minho, Braga, Portugal

Nuno Jerónimo  (10)
University of Minho Information Systems,
Guimarães, Portugal

José Paulo Leal  (4)
CRACS & INESC Tec LA / Faculty of Sciences,
University of Porto, Portugal



- Marcelo A. Marotta  (12)
Department of Computer Science,
University of Brasília (UnB), Brazil
- Ezra Gomes Marques (3)
ALGORITMI Research Centre/LASI – DI,
University of Minho, Braga, Portugal
- Maria João Varanda Pereira (6)
Polytechnic Institute of Bragança, Portugal
- Tomáš Petro (5)
Department of Computers and Informatics,
Technical University of Košice, Slovakia
- H. Sofia Pinto  (2)
Instituto Superior Técnico – Universidade de
Lisboa, Lisbon, Portugal;
INESC-ID Lisboa, Lisbon, Portugal
- Filipe Portela  (10)
University of Minho Algoritmi Center,
Guimarães, Portugal;
IOTECH – Innovation on Technology,
Trofa, Portugal
- Jaroslav Porubän  (5)
Department of Computers and Informatics,
Technical University of Košice, Slovakia
- Ricardo Ribeiro  (2)
Iscte – Instituto Universitário de Lisboa, Lisbon,
Portugal; INESC-ID Lisboa, Lisbon, Portugal
- Mário Rodrigues  (1)
IEETA, ESTGA, University of Aveiro, Portugal;
LASI – Intelligent System Associate Laboratory,
Portugal
- José Rufino (6)
Polytechnic Institute of Bragança, Portugal
- Henrique Santos  (10)
University of Minho Algoritmi Center,
Guimarães, Portugal
- Gabriel Silva  (1)
IEETA, DETI, University of Aveiro, Portugal;
LASI – Intelligent System Associate Laboratory,
Portugal
- António Teixeira  (1)
IEETA, DETI, University of Aveiro, Portugal;
LASI – Intelligent System Associate Laboratory,
Portugal
- Ezequiel José Veloso Ferreira Moreira  (11)
Universidade do Minho, Braga, Portugal;
INESC TEC, Braga, Portugal

■ Committees

Conference Chairs

Filipe Portela
University of Minho, PT

Main Program Chair

Mário Rodrigues
IEETA & ESTGA, University of Aveiro, PT

Gabriel Silva
University of Aveiro, PT

Hugo Oliveira
University of Coimbra, PT

Track Chairs

Human-Human Languages Mário Rodrigues
IEETA & ESTGA, University of Aveiro, PT

Hugo Peixoto
University of Minho, PT

Human-Computer Languages José Paulo Leal
CRACS & INESC Tec LA / Faculty of Sciences,
University of Porto, PT

Irene Rodrigues
University of Évora, PT

Computer-Computer Languages Filipe Portela
University of Minho, IOTTECH – Innovation on
Technology, PT

Jakub Swacha
University of Szczecin, PL

Jan Janousek
Czech Technical University Prague, CZ

Jaroslav Porubán
Technical University of Košice, SK

Organization Committee

Alberto Simões
2Ai Laboratory, School of Technology, IPCA, PT

João Cordeiro
University of Beira Interior, PT

António Teixeira
IEETA & DETI, University of Aveiro, PT

João Rafael Almeida
University of Aveiro, PT

Fábio Marques
IEETA & ESTGA, University of Aveiro, PT

José Paulo Leal
University of Porto, PT

Gabriel Silva
IEETA & DETI, University of Aveiro, PT

José João Almeida
University of Minho, PT

Mário Rodrigues
IEETA & ESTGA, University of Aveiro, PT

Josep Silva
Universitat Politècnica de València, ES

Luís Matos
University of Minho, PT

Scientific Committee

Alberto Simões
Polytechnic Institute of Cávado and Ave, PT

Mário Rodrigues
University of Aveiro, PT

Antoni Oliver
Universitat Oberta de Catalunya, ES

Maria João Pereira
Polytechnic Institute of Bragança, PT

António Teixeira
University of Aveiro, PT

Pablo Gamallo
University of Santiago de Compostela, ES

Bostjan Slivnik
University of Ljubljana, SI

Paulo Matos
Polytechnic Institute of Bragança, PT

Brett Drury
Liverpool Hope University, UK

Pedro Rangel Henriques
University of Minho, PT

Fernando Batista
ISCTE-IUL, PT

Ricardo Rodrigues
University of Coimbra, PT

13th Symposium on Languages, Applications and Technologies (SLATE 2024).
Editors: Mário Rodrigues, José Paulo Leal, and Filipe Portela



OpenAccess Series in Informatics
Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Germany

0:xii **Committess**

Ricardo Rocha
University of Porto, PT

Tiago Pereira
University of Minho, PT

Vladimir Ivančević
University of Novi Sad, RS