

14th Symposium on Languages, Applications and Technologies

SLATE 2025, June 26–27, 2025, Faro, Portugal

Edited by

Jorge Baptista

José Barateiro



Editors

Jorge Baptista 

University of Algarve, Faro, Portugal
INESC-ID Lisbon, Portugal
jbaptis@ualg.pt

José Barateiro 

University of Algarve, Faro, Portugal
NOVA LINCS, Faro, Portugal
jebarateiro@ualg.pt

ACM Classification 2012

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

ISBN 978-3-95977-387-4

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/978-3-95977-387-4>.

Publication date

August, 2025

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.2025.0

ISBN 978-3-95977-387-4

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>Jorge Baptista and José Barateiro</i>	0:vii
List of Authors	
.....	0:ix
Committees	
.....	0:xi

Papers

From Prediction to Precision: Leveraging LLMs for Equitable and Data-Driven Writing Placement in Developmental Education	
<i>Miguel Da Corte and Jorge Baptista</i>	1:1–1:18
A DSL for Swarm Intelligence Algorithms	
<i>Kevin Martins and Rui Mendes</i>	2:1–2:17
Elements for Weighted Answer-Set Programming	
<i>Francisco Coelho, Bruno Dinis, Dietmar Seipel, and Salvador Abreu</i>	3:1–3:16
Vulnerability Detection Across Different CI/CD Platforms	
<i>Vasco Manuel Oliveira, Alberto Simões, and Pedro Rangel Henriques</i>	4:1–4:15
CVTool: Automating Content Variants of CVs	
<i>Julio Beites Gonçalves, Maria João Varanda Pereira, and Pedro Rangel Henriques</i>	5:1–5:14
Beyond the Score: Exploring the Intersection Between Sociodemographics and Linguistic Features in English (L1) Writing Placement	
<i>Miguel Da Corte and Jorge Baptista</i>	6:1–6:18
A Chatbot to Help Promoting Financial Literacy	
<i>Davi Silva Eleuterio, Pedro Filipe Oliveira, Paulo Matos, and Jorge Manuel Afonso Alves</i>	7:1–7:9
An Architecture for Composite Combinatorial Optimization Solvers	
<i>Khalil Chrit, Jean-François Baffier, Pedro Patinho, and Salvador Abreu</i>	8:1–8:16
Semantic Representation of Adverbs in the Lexicalized Meaning Representation (LMR) Framework	
<i>Jorge Baptista, Izabela Müller, and Sónia Reis</i>	9:1–9:18
Stepwise Source, a Supporting Tool for Source Code Demonstration	
<i>João Santos, Alvaro Costa Neto, and Pedro Rangel Henriques</i>	10:1–10:15
Bridging Language Barriers: A Comparative Review and Empirical Evaluation of Source-To-Source Transpilers	
<i>André Freitas, Tiago Baptista, and Pedro Rangel Henriques</i>	11:1–11:16



Portuguese Far-Right Discourse on Social Media: Insights from Topic Modeling <i>Mauro Cardoso, Eugénio Ribeiro, and Fernando Batista</i>	12:1–12:16
Mining GitHub Software Repositories to Look for Programming Language Cocktails <i>João Loureiro, Alvaro Costa Neto, Maria João Varanda Pereira, and Pedro Rangel Henriques</i>	13:1–13:16

Preface

We are pleased to present the proceedings of the 14th Symposium on Languages, Applications and Technologies (SLATE 2025), held at the University of Algarve, Portugal, on June 26 and 27, 2025. This marks the first time SLATE is hosted in the southern region of Portugal, in the University of Algarve, reinforcing the event's commitment to academic decentralisation and broader geographical inclusion.

SLATE continues to be a transdisciplinary forum that brings together researchers and practitioners working in programming languages, natural language processing, and technology-enhanced learning. Contributions span theoretical frameworks and practical implementations, reflecting the diversity and vitality of current research at the intersection of language and technology.

This year's edition featured three distinguished keynote speakers. Pablo Gamallo (CiTIUS / Universidade de Santiago de Compostela) addressed multilingualism and language modelling in his talk Large Language Models for the Galician-Portuguese Diasystem. Pedro Rangel Henriques (Algoritmi / Universidade do Minho) explored formal knowledge representations in An Ontology for the Language Domain. Paulo Quaresma (VISTA Lab / Universidade de Évora) discussed Agentic AI: State of the Art, Challenges and Limitations, offering a critical perspective on autonomous AI systems and their implications.

All submitted papers underwent a double-blind peer review process. We extend our thanks to the Programme Committee and external reviewers for their careful assessments. The selected papers reflect high scientific quality and innovation, and we hope they serve as a valuable contribution to ongoing research in these domains.

We would like to express our gratitude to all authors, keynote speakers, reviewers, and participants. Special thanks are due to the organising committee, institutional partners, and local volunteers for their unwavering dedication and support.

We trust these proceedings will provide a stimulating reading and inspire further research collaborations across communities.

The SLATE 2025 Chairs

Jorge Baptista and José Barateiro (Universidade do Algarve)

■ List of Authors

Salvador Abreu  (3, 8)
NOVA-LINCS, University of Évora, Portugal

Jorge Manuel Afonso Alves  (7)
UNIAG, Instituto Politécnico de Bragança,
Portugal

Jean-François Baffier  (8)
IIJ Research, Tokyo, Japan

Jorge Baptista  (1, 6, 9)
University of Algarve, Campus de Gambelas,
Faro, Portugal;
INESC-ID Lisboa, Portugal

Tiago Baptista  (11)
ALGORITMI Research Centre / LASI, Dept. of
Informatics, University of Minho, Braga,
Portugal

Fernando Batista  (12)
Instituto Universitário de Lisboa (ISCTE-IUL),
Portugal;
INESC-ID Lisboa, Portugal

Mauro Cardoso  (12)
Instituto Universitário de Lisboa (ISCTE-IUL),
Portugal;
INESC-ID Lisboa, Portugal

Khalil Chrit  (8)
NOVA LINCS, University of Évora, Portugal

Francisco Coelho  (3)
NOVA-LINCS, University of Évora, Portugal

Alvaro Costa Neto  (10, 13)
ALGORITMI Research Centre/LASI – DI,
University of Minho, Braga, Portugal;
Research Centre in Digitalization and Intelligent
Robotics (CeDRI), Laboratório Associado para
a Sustentabilidade e Tecnologia em Regiões de
Montanha (SusTEC), Instituto Politécnico de
Bragança, Portugal;
Instituto Federal de Educação, Ciência e
Tecnologia de São Paulo, Barretos, Brazil

Miguel Da Corte  (1, 6)
University of Algarve, Campus de Gambelas,
Faro, Portugal;
INESC-ID Lisboa, Portugal

Bruno Dinis  (3)
CIMA, University of Évora, Portugal

Davi Silva Eleuterio  (7)
UNIAG, Instituto Politécnico de Bragança,
Portugal

André Freitas  (11)
ALGORITMI Research Centre / LASI, Dept. of
Informatics, University of Minho, Braga,
Portugal

Julio Beites Gonçalves (5)
ALGORITMI Research Centre/LASI – DI,
University of Minho, Braga, Portugal

Pedro Rangel Henriques  (4, 5, 10, 11, 13)
ALGORITMI Research Centre / LASI, Dep. of
Informatics, University of Minho, Braga,
Portugal

João Loureiro (13)
ALGORITMI Research Centre/LASI – DI,
University of Minho, Braga, Portugal

Kevin Martins  (2)
ALGORITMI Research Centre,
University of Minho, Braga, Portugal

Paulo Matos  (7)
CeDRI, Instituto Politécnico de Bragança,
Portugal

Rui Mendes  (2)
LASI Research Centre, University of Minho,
Braga, Portugal

Izabela Müller  (9)
University of Algarve, Faro, Portugal;
INESC-ID Lisboa, Portugal

Pedro Filipe Oliveira  (7)
CeDRI, Instituto Politécnico de Bragança,
Portugal

Vasco Manuel Oliveira (4)
Checkmarx, Braga, Portugal; ALGORITMI
Research Centre/LASI, Dep. of Informatics,
University of Minho, Braga, Portugal

Pedro Patinho  (8)
NOVA LINCS, University of Évora, Portugal

Maria João Varanda Pereira  (5, 13)
Research Centre in Digitalization and Intelligent
Robotics (CeDRI), Laboratório Associado para
a Sustentabilidade e Tecnologia em Regiões de
Montanha (SusTEC), Instituto Politécnico de
Bragança, Portugal

14th Symposium on Languages, Applications and Technologies (SLATE 2025).

Editors: Jorge Baptista and José Barateiro



OpenAccess Series in Informatics

Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Germany

Sónia Reis  (9)

University of Algarve, Faro, Portugal;
INESC-ID Lisboa, Portugal

Eugénio Ribeiro  (12)

Instituto Universitário de Lisboa (ISCTE-IUL),
Portugal;
INESC-ID Lisboa, Portugal

João Santos  (10)

ALGORITMI Research Centre/LASI – DI,
University of Minho, Braga, Portugal

Dietmar Seipel  (3)

Universität Würzburg, Germany

Alberto Simões  (4)

Checkmarx, Braga, Portugal;
2Ai – School of Technology, IPCA,
Barcelos, Portugal;
LASI – Associate Laboratory of Intelligent
Systems, Guimarães, Portugal

■ Committees

Organization Committee

Jorge Baptista
University of Algarve, Portugal

José Barateiro
University of Algarve, Portugal

Simão Melo de Sousa
University of Algarve, Portugal

Alberto Simões
2Ai, School of Technology, IPCA, Portugal

Dietmar Seipel
University of Würzburg, Germany

Eugénio Ribeiro
INESC-ID Lisboa & ISCTE-IUL, Portugal

Fernando Baptista
INESC-ID & ISCTE-IUL, Portugal

Filipe Portela
UM & ESMAD, Portugal

Geylani Kardas
Ege University, Turkey

Scientific Committee

Alberto Simões
2Ai, School of Technology, IPCA, Barcelos,
Portugal

Alexander Paar
TWT GmbH Science & Innovation, Germany

Ana Alves
University of Coimbra, Portugal

Andreas Rauber
TT Wien, Austria

António Teixeira
University of Aveiro, Portugal

António Cruz
Instituto Politécnico de Viana do Castelo,
Portugal

António Menezes Leitão
Universidade Técnica de Lisboa, Portugal

Barrett Bryant
University of North Texas, USA

Bostjan Slivnik
University of Ljubljana, Slovenia

Brett Drury
Liverpool Hope University, UK

Daniela da Cruz
DataDog, Portugal

Diana Santos
Universidade de Oslo, Norway

Giovani Librelotto
Universidade Federal de Santa Maria, Brazil

Hugo Gonçalo Oliveira
Universidade de Coimbra, Portugal

Irene Rodrigues
Universidade de Évora, Portugal

Ivan Lukovic
University of Novi Sad, Serbia

Jakub Swacha
University of Szczecin, Poland

Jan Janousek
Czech Technical University, Czech Republic

Jaroslav Poruban
Technical University of Kosice, Slovakia

João Saraiva
Universidade do Minho, Portugal

João Paulo Fernandes
Universidade de Coimbra, Portugal

Jorge Baptista
U. Algarve & L2F-Spoken Language Lab,
INESC ID Lisboa, Portugal

José Barateiro
Universidade do Algarve, Portugal

José Borbinha
INESC-ID, Portugal

José Carlos Paiva
Universidade do Porto, Portugal

14th Symposium on Languages, Applications and Technologies (SLATE 2025).

Editors: Jorge Baptista and José Barateiro



OpenAccess Series in Informatics

Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Germany

José João Almeida Universidade do Minho, Braga, Portugal	Salvador Abreu Universidade de Évora, Portugal
José Luís Sierra Universidad Complutense de Madrid, Spain	Sérgio Paulo INESC-ID Lisboa, Portugal
José Paulo Leal Faculdade de Ciências, Universidade do Porto, Portugal	Simão Melo de Sousa Universidade da Beira Interior, Portugal
Josep Silva Universidad Politécnica de Valencia, Spain	Susana Correia Universidade Nova de Lisboa, FCSH, Portugal
Luísa Coheur U.Lisboa/IST & INESC-ID Lisboa, Portugal	
Marcos Garcia Gonzalez Universidade de Santiago de Compostela, Spain	
Maria João Varanda Instituto Politécnico de Bragança, Portugal	
Mario Beron Universidad Nacional de San Luis, Argentina	
Mário Pinto Politécnico do Porto, Portugal	
Marjan Mernik Univerza v Mariboru, Slovenia	
Pablo Gamallo Universidade de Santiago de Compostela, Spain	
Paulo Quaresma Universidade de Évora, Portugal	
Pedro Henriques Universidade do Minho, Portugal	
Raquel Amaro Universidade Nova de Lisboa, FCSH, Portugal	
Ricardo Rodrigues Universidade de Coimbra, Portugal	
Ricardo Queirós IPP/ESMAD, Portugal	
Ricardo Rocha Universidade do Porto, Portugal	
Ruben Solera Ureña INESC-ID Lisboa, Portugal	