Iacer Calixto

Address: New York University, 60 5th Avenue, Office #637, Manhattan, NY.

Languages: Portuguese (native); English (fluent); French, Italian, and Spanish (professional proficiency).

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Nationality: Brazilian citizen, born in July, 1983.

Professional Experience

New York University   **Mar. 2019 – now**
Visiting Postdoctoral Fellow in the Courant Institute for Mathematical Sciences and Center for Data Science (CDS).

- I am a **Marie Skłodowska-Curie Global Fellow** working on a personal research project called "IMAGINE: Informing Multi-modal Language Generation With World Knowledge".

- I collaborate with many people in the Machine Learning for Language group (ML^2), especially prof. Kyunghyun Cho and prof. Sam Bowman. Broad research areas include latent variable models, multi-modal machine learning, and zero-shot cross-lingual transfer learning.

University of Amsterdam   **Mar. 2018 – now**
Postdoctoral Research Fellow in the Institute for Logic, Language and Computation (ILLC).

- **Mar. 2019 – now** I am affiliated to the Dialogue Modelling group where I work with prof. Raquel Fernández.

- **Mar. 2018 – Mar. 2019** I worked with prof. Wilker Aziz and prof. Khalil Sima'an.

- Research topics include deep generative models for language, representation learning for vision and language, and multi-modal machine translation.

- I sometimes teach in the Master of AI.

ADAPT Centre, Dublin City University   **Jul. 2017 – Mar. 2018**
Research Associate/Postdoctoral Fellow in the ADAPT Centre / School of Computing.

- Collaborated with PhD students, co-supervised 8 MSc. students, and worked on research projects with industry partners under the supervision of prof. Andy Way.

- I worked on a project with *eBay Inc.* where we applied *multi-modal machine translation* to improve their e-commerce platform. The main goal was to train neural models to translate product listings while also using the products images, both user-generated data.

- Some topics I worked on include multi-modal neural machine translation, multi-task learning, and multilingual and multi-modal representation learning.

La Sapienza Università di Roma   **Oct. 2014 – Dec. 2014**
Research Assistant/Intern in the Computer Science department.

- I used machine learning approaches to automatically identify images available in Wikipedia article pages to illustrate concepts in BabelNet. I was supervised by prof. Roberto Navigli.

The University of Sheffield   **Jun. 2012 – Sep. 2012**
Research Assistant/Intern in the Computer Science department.

- I worked on exploiting images as contextual information to increase the quality of statistical machine translation systems. I was funded by the EPSRC Network on Vision and Language (UK) and co-supervised by prof. Lucia Specia and prof. Teófilo de Campos.

Teaching Experience

University of Wolverhampton,   Erasmus Master in Technology for Translation and Interpreting   2021
I am a visiting scholar in the EM-TTI Master. I aided the **Machine Translation** module leader prof. Fréderic Blain in the design of the module, and also lectured seven classes with 1h30–2h00 each (∼12 hours overall). I am also guest lecturer in the **Machine Learning** module in the **Computational Linguistics** master. I lectured four classes with 1h30–2h00 each (∼7 hours overall).

University of Amsterdam,   Master of Artificial Intelligence   2018, 2019
I was lecturer for **Natural Language Processing 2**: language models, statistical and neural machine translation, generative models for NLP, neural networks.

Dublin City University,   BSc. in Computer Science   2015, 2016
I was teaching assistant for **Statistical Machine Translation** and **Developing Internet Applications**.

Education

Dublin City University   2013 – 2017
PhD in Computer Science
Thesis: Incorporating visual information into neural machine translation
Supervisors: prof. Qun Liu and prof. Nick Campbell (Trinity College Dublin).
Summary: I proposed different methods to incorporate features derived from images into neural machine translation (NMT) and obtained promising results. I applied multi-modal NMT models to translate image descriptions from Flickr and also product listings from eBay, and was able to improve translations across different use-cases. I also proposed models to fuse vision and language information in the context of searching and indexing.

University of Wolverhampton, Université de Franche-Comté, Universidade do Algarve   2011 – 2013
Erasmus Mundus Master (multiple Degrees)
Summary: I worked on the automatic extraction of information from research papers. It covered the fields of NLP, machine learning, information extraction and data mining.

Universidade Federal de Goiás   2009 – 2011
MSc. in Computer Science
Summary: I worked on an optimisation problem to improve city traffic: the *estimation of origin-destination demand matrices based on fuzzy linear programming for Brazilian congested traffic networks*.
I covered topics involving computer theory, graphs, algorithms and non-linear optimisation.
I registered for 8 modules and obtained the highest grade (A) in all of them.

Faculdades Alves Faria   2003 – 2007
BSc. in Information Systems

Supervision

Independent Study (Center for Data Science, New York Univesity)
Jan.2020 – Now Y. Liu, T. Huang, Y. Deshpande: Learning representations for multi-modal knowledge graphs.

MSc. Thesis (Master in Artificial Intelligence, University of Amsterdam)
Feb.2019 – Nov.2019 J. Leible: Jointly learning to tag images and translate.
Feb.2019 – Oct.2019 V. Milewski: Image description generation with objects and graph reasoning.
Jan.2019 – Aug.2019 H. Alberts: Grounding image encoders using knowledge base information.
Jan.2019 – Aug.2019 V. Kadar: HyGAP: Hybrid context-based embeddings generated from taxonomical paths.
Jul.2018 – Jun.2019 F. Curi: Incorporating typological linguistic features into low-resource machine translation.

Project AI (Master in Artificial Intelligence, University of Amsterdam)
Jul.2018 – Dec.2018 V. Milewski: A topic mixture model for neural image description generation.

Grants and Awards

- **2019 – 2020**, **Outstanding Reviewer Award**, Empirical Methods for Natural Language Processing (EMNLP).

- **2019**, **Marie-Skłwodowska-Curie Global Fellowship** valued at €232, 393.92

- **2017**, **Best Long Paper Award**, The International Conference on Natural Language Generation (INLG) for the paper Linguistic realisation as machine translation: Comparing different MT models for AMR-to-text generation

- **2017**, DCU Postgraduate **Grant** (€500) and ADAPT Centre Director's Commercialisation **Award** (€2, 500)

- **2016**, DCU Invent Commercialisation **Award** valued at €300

- **2015 – 2017**, Five grants from **COST Action IC1307 Integrating Vision & Language** valued at €6, 580

- **2013 – 2017**, PhD **Scholarship** funded by Science Foundation Ireland (SFI)

- **2011 – 2013**, Erasmus Mundus Master **Scholarship** funded by Master in NLP & HTL

- **2009 – 2011**, CAPES MSc. **Scholarship** (in Brazil)

- **2008**, Best Student **Award** competing against ~ 300 Information Systems BSc. students

- **2007**, Best Student **Award** competing against ~ 300 Information Systems BSc. students

Professional services

Area Chair: EACL (2021)

Standing Reviewer: Computational Linguistics Journal (2020–)

Program Committee Member / Reviewer
Journals: Artificial Intelligence (Elsevier, since 2019); Machine Translation (Springer, since 2018); Computational Linguistics (since 2018); Natural Language Engineering (Cambridge, since 2019); Prague Bulleting of Mathematical Linguistics (PBML, since 2017); IEEE Transactions on Neural Networks and Learning Systems (since 2019), Sensors (MDPI, since 2020).

Conferences: ACL (2018–2021); EMNLP (2018–2021); NAACL (2019,2021); ICLR (2020–2021); IJCAI-ECAI (2018–2020); AAAI (2019–2020); COLING (2018,2020); EAMT (2018, 2020); RANLP (2017); MT Summit (2019).

Workshops: LANTERN Beyond Vision & Language (2020), Shortcomings on Vision & Language (2019).

Co-organiser of Workshops: Representation Learning for NLP (RepL4NLP) Workshop 2021; Low-Resource Machine Translation (LoResMT) Workshop, co-located with AMTA (2018); Comparable Corpora (Cupral) Workshop, co-located with IJCNLP (2017).

Committees and Memberships

- **ELLIS Society, 2020 – now** Member of the European Laboratory for Learning and Intelligent Systems (ELLIS).

- **KU Leuven, Supervisory committee, 2020 – now** Member of Victor Mileswki's PhD supervisory committee led by prof. Marie-Francine Moens.

- **New York Academy of Sciences, 2019 – now** Member of the NYAS.

- **University of Amsterdam, Examinations board, 2019 – now** Member of the Examinations Board, Master of Artificial Intelligence.

- **Multi3Generation COST Action, Management Committee, 2019 – now** Member of the Management Committee of the Multi3Generation COST Action, on the topic of natural language generation involving multilingual and multi-modal language generation. I am proud to say that I actively helped shape this Action by spearheading discussions around the subject and by writing the first draft of the Action proposal.

- **University of Amsterdam, 2018 – 2019** Internal examiner for Tom Baumgärtner's and Mathijs Mul's MSc. theses, Master of Logic. Internal examiner for Evi Hendrikx's report, Master Brain and Cognitive Sciences.

Selected Research Activities and Outcomes

- I am a Marie-Skłodowska-Curie Global Fellow and work on my personal project **IMAGINE: Informing Multimodal Language Generation With World Knowledge** with the goal of incorporating visual commonsense and world knowledge into models that generate language.

- An independent data-driven study conducted by Marek Rei at the University of Cambridge had me included among the most prolific first authors in top-tier Machine Learning / Natural Language Processing conferences in 2017 (see http://www.marekrei.com/blog/ml-nlp-publications-in-2017/).

- I spearheaded the discussion and drafting of the **Multi3Generation** COST Action proposal on the topic of natural language generation.

Invited Talks and Seminars

17 Jun/2021 Helsinki NLP: Research Seminar in Language Technology.
Invited talk on theme to be decided.

15 Jun/2021 RGCL Machine Learning and Deep Learning Seminar Series.
Invited talk on theme to be decided.

14 Mar/2021 Probabilistic Language Learning Group.
Invited talk on our paper *Wikipedia Entities as Rendezvous across Languages: Grounding Multilingual Language Models by Predicting Wikipedia Hyperlink.*

11 Mar/2021 Cardiff University NLP.
Invited talk on our paper *Wikipedia Entities as Rendezvous across Languages: Grounding Multilingual Language Models by Predicting Wikipedia Hyperlink.*

2 Dec/2020 LIIR Seminar at KU Leuven.
Invited talk on our paper *Seeing past words: Testing the cross-modal capabilities of pretrained V&L models.*

28 Sep/2020 Machine Learning meet-up, Dublin.
Invited talk on our paper *Are scene graphs good enough to improve image captioning?*

27 Jun/2018 Summer School on Translation (In Portuguese) in the Faculty of Arts of Univ. do Porto
Two invited lectures on statistical and neural machine translation (two days).

8 Dec/2017 GIAN Workshop, Indian Institute of Technology Patna.
Invited lecture to the workshop.

25 Oct/2017 Colloquium of Department of Computational Linguistics, Universität Heidelberg.
Invited talk on my PhD research.

6 July/2017 NLP Group Seminar, Department of Computer Science, The University of Sheffield.
Invited talk on my PhD research.

5 Apr/2016 Computational Linguistics Seminar, ILLC, The University of Amsterdam.
Invited talk on my PhD research.

Selected peer-reviewed publications

In 2018 I have a publication gap because I was involved full-time on an applied project with eBay Inc. while I was Research Associate at the ADAPT Centre.

[1] **Journal of Artificial Intelligence Research 2021 (Under Review).** Erkut Erdem, Menekse Kuyu, Semih Yagcioglu, Anette Frank, Letitia Parcalabescu, Barbara Plank, Andrii Babii, Oleksii Turuta, Aykut Erdem, **Iacer Calixto**,

Elena Lloret, Elena-Simona Apostol, Ciprian-Octavian Truică, Branislava Šandrih, Albert Gatt, Sanda Martinčić-Ipšić, Gábor Berend, Gražina Korvel. *Neural Natural Language Generation: A Survey on Multilinguality, Multimodality, Controllability and Learning.*

[2] **ACL 2021 (Under Review).** Letitia Parcalabescu, Albert Gatt, Anette Frank, **Iacer Calixto**. *Seeing past words: Testing the cross-modal capabilities of pretrained V&L models*.

[3] **NLP in Healthcare 2021 (Under Review). Iacer Calixto**, Victoria Yaneva, Raphael Moura Cardoso. *Natural language processing for mental disorders: an overview*. In: Natural Language Processing in Healthcare: A Special Focus on Low Resource Language (Book Chapter).

[4] **Pre-print (work-in-progress).** Ningyuan (Teresa) Huang, Yash Deshpande, Yibo Liu, Houda Alberts, Kyunghyun Cho, Clara Vania, **Iacer Calixto**. *Learning Robust Multimodal Knowledge Graph Representations*.

[5] **Pre-print (work-in-progress).** Houda Alberts, Teresa Huang, Yash Deshpande, Yibo Liu, Kyunghyun Cho, Clara Vania, **Iacer Calixto**. *VisualSem: a high-quality knowledge graph for vision and language*.

[6] **NAACL 2021. Iacer Calixto**, Tommaso Pasini, Alessandro Raganato. *Wikipedia Entities as Rendezvous across Languages: Grounding Multilingual Language Models by Predicting Wikipedia Hyperlinks*. In: Proceedings of 2021 Annual Conference of the North-American Chapter of the Association for Computational Linguistics.

[7] **WiNLP 2020.** Diksha Meghwal, Katharina Kann, **Iacer Calixto**, Stanislaw Jastrzebski. *Can Wikipedia Categories Improve Masked Language Model Pretraining?* In: Proceedings of The Fourth Widening Natural Language Processing Workshop.

[8] **IJCNLP-AACL 2020.** Victor Milewski, Marie-Francine Moens, **Iacer Calixto**. *Are scene graphs good enough to improve image captioning?*. In: Proceedings of the IJCNLP-AACL 2020.

[9] **IJCNLP-AACL 2020.** Jason Phang†, **Iacer Calixto**†, Phu Mon Htut, Yada Pruksachatkun, Haokun Liu, Clara Vania, Katharina Kann, Samuel R. Bowman. *English Intermediate-Task Training Improves Zero-Shot Cross-Lingual Transfer Too*. In: Proceedings of the IJCNLP-AACL 2020. †Equal contribution.

[10] **ACL 2019. Iacer Calixto**, Miguel Rios, Wilker Aziz. *Latent Variable Model for Multi-modal Translation*. In: Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics.

[11] **MT Journal 2019. Iacer Calixto**, Qun Liu. *An Error Analysis for Image-Based Multi-Modal Neural Machine Translation*. Machine Translation Journal: Special Issue in Human Factors in Neural Machine Translation.

[12] **CICLing 2019.** Haree Jeyaram, Mohammed Hasanuzzaman, **Iacer Calixto**, Andy Way. *Multimodal Image News Article Alignment*. (*paper accepted*). In: Proceedings of CICLing 2019, the 20th International Conference on Computational Linguistics and Intelligent Text Processing.

[13] **ACL 2017. Iacer Calixto**, Qun Liu, Nick Campbell. *Doubly-Attentive Decoder for Multi-modal Neural Machine Translation*. In: Proceedings of the 55th Annual Meeting of the Association for Computational Linguistics.

[14] **EMNLP 2017. Iacer Calixto**, Qun Liu. *Incorporating Global Visual Features into Attention-Based Neural Machine Translation*. In: Proceedings of the 2017 Conference on Empirical Methods in Natural Language Processing.

[15] **EACL 2017. Iacer Calixto**, Daniel Stein, Evgeny Matusov, Pintu Lohar, Sheila Castilho, Andy Way. *Using Images to Improve Machine-Translating E-Commerce Product Listings*. In: The Meeting of the European Chapter of the Association for Computational Linguistics.

[16] **RANLP 2017. Iacer Calixto**, Qun Liu. *Sentence-Level Multilingual Multi-Modal Embedding for Natural Language Processing*. In: Recent Advances in Natural Language Processing.

[17] **VL 2017. Iacer Calixto**, Daniel Stein, Evgeny Matusov, Sheila Castilho, Andy Way. *Human Evaluation of Multi-modal Neural Machine Translation: A Case-Study on E-Commerce Listing Titles*. In: The Integrating Vision &

Language Workshop.

[18] **INLG 2017.** Thiago Castro Ferreira, **Iacer Calixto**, Sander Wubben and Emiel Krahmer. *Linguistic realisation as machine translation: Comparing different MT models for AMR-to-text generation*. In: The International Natural Language Generation conference. **Best Long Paper Award**.

[19] **PBML 2017.** Sheila Castilho, Joss Moorkens, Federico Gaspari, **Iacer Calixto**, John Tinsley and Andy Way. *Is Neural Machine Translation the New State-of-the-Art?* In: Prague Bulletin of Mathematical Linguistics.

[20] **WMT 2016. Iacer Calixto**, Desmond Elliott, Stella Frank. *DCU–UvA Multimodal MT System Report*. In: The First Conference on Machine Translation.

[21] **WMT 2016.** Chris Hokamp, **Iacer Calixto**. *Multimodal neural machine translation using minimum risk training*. In: The First Conference on Machine Translation.

[22] **LREC 2016.** Debasis Ganguly, **Iacer Calixto**, Gareth Jones. *Developing a Dataset for Evaluating Approaches for Document Expansion with Images*. In: Proceedings of the Tenth International Conference on Language Resources and Evaluation.

[23] **RANLP 2015.** Sanja Stajner, **Iacer Calixto**, Horacio Saggion. *Automatic Text Simplification for Spanish: Comparative Evaluation of Various Simplification Strategies*. In: Recent Advances in Natural Language Processing.

[24] **WMT 2014.** Chris Hokamp, **Iacer Calixto**, Joachim Wagner, Jian Zhang. *Target-Centric Features for Translation Quality Estimation*. In: The Workshop on Statistical Machine Translation.

[25] **WMT 2014.** Jian Zhang, Xiaofeng Wu, **Iacer Calixto**, Ali Vahid, Andy Way, Qun Liu. *Experiments in Medical Translation Shared Task at WMT 2014*. In: The Workshop on Statistical Machine Translation.

[26] **EJOR 2013.** Les Foulds, Hugo do Nascimento, **Iacer Calixto**, Bryon Hall, Humberto Longo. *A fuzzy set based approach to origin-destination matrix estimation in urban traffic networks with imprecise data*. In: **The European Journal of Operations Research**.

[27] **VL 2012. Iacer Calixto**, Lucia Specia, Teófilo de Campos. *Images as context in Statistical Machine Translation*. In: The Workshop on Vision and Language.

[28] **SBPO 2011.** Les Foulds, Hugo do Nascimento, **Iacer Calixto**, Bryon Hall, Humberto Longo. *A fuzzy set approach to estimating OD matrices in congested Brazilian traffic networks*. In: XLIII Simpósio Brasileiro de Pesquisa Operacional.