Pedro Zuidberg Dos Martires
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Employment

Apr 2022 -	**Örebro University** (Sweden) Postdoctoral Researcher in the MPI Lab
Dec 2020 - Feb 2022	**KU Leuven** (Belgium) Postdoctoral Researcher in the DTAI Lab
Apr 2016 - Nov 2020	**KU Leuven** (Belgium) Research Assistant in the DTAI Lab

Education

Apr 2016 - Nov 2020	**KU Leuven** (Belgium), **Department of Computer Science** PhD in Computer Science, Artificial Intelligence *From Atoms to Possible Worlds: Probabilistic Inference in the Discrete-Continuous Domain* Defended on November 25, 2020 Supervised by Prof. Luc De Raedt
Aug 2013 - Aug 2015	**University of Amsterdam** (Netherlands), **Faculty of Physics** Master of Science in Particle Physics
Oct 2012 - Jan 2013	**University of Lisbon** (Portugal) Exchange Student
Oct 2009 - Oct 2012	**University of Vienna** (Austria), **Faculty of Physics** Bachelor of Science in Physics

Research Interests

Broadly speaking, my research interests lie with artificial intelligence and machine learning, while having a focus on probabilistic programming. My overarching scientific goal is to develop systems that are capable of reasoning and learning with raw sensor data. In order to achieve this, I believe in the necessity of a holistic approach, which is also reflected in my specific research activities – ranging from probabilistic inference with discrete and continuous variables [4, 5, 8, 9], over formal probabilistic logic programming [3, 11], to cognitive robotics [1, 2]. Recently, I have also started exploring neuro-symbolic techniques in order to combine symbolic and subsymbolic representations of the world [14].

Research Visits

Oct 2022	Attendence of the ELLIIT Focus Period (Linköping, Sweden)
Jan 2022 - Feb 2022	Research stay in the **SML Group** (Trento, Italy) with Prof. Andrea Passerini
Aug 2018	Research stay at the **MPI Lab** (Örebro, Sweden) with Prof. Amy Loutfi
Jul 2015	Research stay at **CERN** (Geneva, Switzerland) with Prof. Davide Berge
Jun 2014 - Aug 2014	Summer Student at **CERN** , data analysis at the Large Hadron Collider, supervised by Pamela Ferrari

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Grants and Awards

Jul 2020	Recipient of a Postdoctoral Mandate at the KU Leuven, includes personal stipend for full year of postdoctoral research
Aug 2008	Distinguished paper award at the Junior Mathematical Congress (Jena, Germany)

Teaching

- Co-organizer and instrucot, **Summer School on Roboitcs**
  Örebro University, 2022
  Four week long summer school for undergradute students from Aston University
- Teaching assistant, **Databases**
  KU Leuven (2020-2021, 2021-2022)
  Course on databases in the Computer Science Master's program
- Teaching assistant, **Uncertainty in Artificial Intelligence**
  KU Leuven (2016-2017, 2017-2018, 2018-2019, 2019-2020, 2020-2021, 2021-2022)
  Course on probabilistic artificial intelligence in the Computer Science Master's program
- Teaching assistant, **Information Structures and Implications**
  KU Leuven (2016-2017, 2017-2018, 2020-2021, 2021-2022)
  Database course for students in the Digital Humanities Master's program
- Teaching assistant, **Introduction to Physics**
  University of Vienna (2011-2012)
  Introductory course on physics in the Physics Bachelor's program

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Mentorship & Advisees

PhD Students

I co-supervise, together with Prof. Luc De Raedt, two Phd students.

- Arvid Norlander, Örebro Universty, 2022-

- Rishi Hazra, Örebro Universty, 2022-

I have been the daily advisor and mentor of three PhD students under the supervision of Prof. Luc De Raedt.

- Lennert De Smet, KU Leuven, 2021-
- Gabriele Venturato, KU Leuven, 2020-
- Victor Verreet, KU Leuven, 2019-

Master Students

- Marcus Håkansson, Örebro Universty, 2022-
- Michiel Baptist, KU Leuven, 2018-2019
- Pieter-Jan Coenen, KU Leuven, 2018-2019
- Evert, Heylen KU Leuven, 2018-2019
- Rei Bardhi, KU Leuven, 2018-2019
- Olivier, Kamers KU Leuven, 2017-2018
- Niels Wéry, KU Leuven, 2016-2017

Bachelor Students

- Tibo Van den Eede, KU Leuven, 2021-2022
- Sam Vervaeck, 2021-2022

Interns

- Shani Vanlerberghe, KU Leuven, Summer 2019
- Ivan Miošić, KU Leuven, Summer 2019 (Erasmus Internship)

Skills

Soft Skills

Funding: I have experience reporting on external funding (ReGROUND project) and successfully writing grant applications (Postdoctoral Mandate at the KU Leuven).

Networking: I am an active member of the research community and have, for instance, hosted Prof. Robert Peharz and Dr. Vissarion Fisikopoulos at the KU Leuven.

Organizing: I have been involved in organizing various scientific events and workshops, e.g. the biannual Fluffy workshp of the DTAI lab at the KU Leuven or the Summer school on Robotics at the University of Örebro.

Technical Skills

- AI/ML software: ProbLog, PyTorch, Tensorflow, Robot Operating System
- Programming languages: Python, C++, Julia, DLang

Languages

Luxembourgish: native speaker
German: native speaker
French: fluent
English: fluent
Portuguese: good command
Dutch: good command

Professional Activities & Service

Program Committee Member

- 2022 – International Conference on Artificial Intelligence and Statistics (AISTATS)
- 2022 – Workshop on Tractable Probabilistic Modeling (TPM)
- 2022 – Uncertainty in Artificial Intelligence (UAI)
- 2022 – International Joint Conference on Artificial Intelligence (IJCAI)
- 2022 – Conference on Artificial Intelligence (AAAI)
- 2021 – International Joint Conference on Learning and Reasoning (IJCLR)
- 2021 – Workshop on Tractable Probabilistic Modeling (TPM)
- 2021 – International Conference on Probabilistic Programming (ProbProg)
- 2021 – Uncertainty in Artificial Intelligence (UAI)
- 2021 – International Joint Conference on Artificial Intelligence (IJCAI)
- 2021 – Conference on Artificial Intelligence (AAAI)
- 2020 – Deep Continuous-Discrete Machine Learning (DecodeML)
- 2020 – International Workshop on Statistical Relational AI (StarAI)
- 2020 – European Conference on Artificial Intelligence (ECAI)
- 2020 – Conference on Artificial Intelligence (AAAI)
- 2019 – International Workshop on Statistical Relational AI (StarAI)

Journal Reviewing

- Artificial Intelligence Journal
- International Journal of Approximate Reasoning

Volunteering

I have participated in the Summer School of Science in Croatia as a project leader. The summer school is a ten day event during which a small group of high school students works out their own research project and present their research to peers. I have had the opportunity to supervise two such projects (2017, 2018).

Publications

Journal Publications

[1] A. Persson*, **P. Zuidberg Dos Martires***, A. Loutfi, and L. De Raedt. "Semantic Relational Object Tracking". In: *IEEE Transactions on Cognitive and Developmental Systems* 12.1 (2020).

[2] **P. Zuidberg Dos Martires***, N. Kumar, A. Persson, A. Loutfi, and L. De Raedt. "Symbolic Learning and Reasoning with Noisy Data for Probabilistic Anchoring". In: *Frontiers in Robotics and AI* 7 (2020).

Conference Publications

[3] V. Verreet*, V. Derkinderen, **P. Zuidberg Dos Martires**, and L. De Raedt. "Inference and Learning with Model Uncertainty in Probabilistic Logic Programs". In: *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*. 2022.

[4] P. Morettin*, **P. Zuidberg Dos Martires***, S. Kolb*, and A. Passerini. "Hybrid probabilistic inference with logical and algebraic constraints: a survey". In: *Proceedings of the 30th International Joint Conference on Artificial Intelligence (IJCAI)*. 2021.

[5] V. Derkinderen*, E. Heylen, **P. Zuidberg Dos Martires**, S. Kolb, and L. De Raedt. "Ordering Variables for Weighted Model Integration". In: *Proceedings of the Uncertainty in Artificial Intelligence Conference (UAI)*. 2020.

[6] A. Persson*, **P. Zuidberg Dos Martires**, L. De Raedt, and A. Loutfi. "ProbAnch: a Modular Probabilistic Anchoring Framework". In: *Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI)*. 2020.

[7] S. Kolb*, P. Morettin, **P. Zuidberg Dos Martires**, F. Sommavilla, A. Passerini, R. Sebastiani, and L. De Raedt. "The pywmi Framework and Toolbox for Probabilistic Inference using Weighted Model Integration". In: *Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI)*. 2019.

[8] S. Kolb*, **P. Zuidberg Dos Martires***, and L. De Raedt. "How to Exploit Structure while Solving Weighted Model Integration Problems". In: *Proceedings of the Uncertainty in Artificial Intelligence Conference (UAI)*. 2019.

[9] **P. Zuidberg Dos Martires***, A. Dries, and L. De Raedt. "Exact and Approximate Weighted Model Integration with Probability Density Functions Using Knowledge Compilation". In: *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*. 2019.

Tutorials

[10] P. Morettin, **P. Zuidberg Dos Martires**, S. Kolb, and A. Passerini. "Hybrid Probabilistic Inference with Algebraic and Logical Constraints". In: *31st International Joint Conference on Artificial Intelligence (IJCAI)*. 2022. URL: https://dtai.cs.kuleuven.be/tutorials/wmitutorial.

Doctoral Thesis

[11] **P. Zuidberg Dos Martires***. "From Atoms to Possible Worlds: Probabilistic Inference in the Discrete-Continuous Domain". PhD thesis. KU Leuven, 2020.

Workshop & Non-Archival Publications

[12] L. De Smet*, R. Manhaeve, G. Marra, and **P. Zuidberg Dos Martires**. "Tensorised Probabilistic Inference for Neural Probabilistic Logic Programming". In: *The 5th Workshop on Tractable Probabilistic Modeling*. 2022.

[13] G. Venturato*, V. Derkinderen, **P. Zuidberg Dos Martires**, and L. De Raedt. "Towards Tractable Dynamic Decision Making With Circuits". In: *5th Workshop on Tractable Probabilistic Modeling*. 2022.

[14] **P. Zuidberg Dos Martires***. "Neural Semirings". In: *15th International Workshop on Neural-Symbolic Learning and Reasoning (NeSy)*. 2021.

[15] **P. Zuidberg Dos Martires*** and S. Kolb. "Monte Carlo Anti-Differentiation for Approximate Weighted Model Integration". In: *Ninth International Workshop on Statistical Relational AI (StarAI)*. 2020.

[16] O. A. Can*, **P. Zuidberg Dos Martires***, A. Persson, J. Gaal, A. Loutfi, L. De Raedt, D. Yuret, and A. Saffiotti. "Learning from Implicit Information in Natural Language Instructions for Robotic Manipulations". In: *Combined Workshop on Spatial Language Understanding and Grounded Communication for Robotics (SpLU-RoboNLP)*. 2019.

[17] **P. Zuidberg Dos Martires***, A. Dries, and L. De Raedt. "Knowledge Compilation with Continuous Random Variables and its Application in Hybrid Probabilistic Logic Programming". In: *Eigth International Workshop on Statistical Relational AI, (StarAI)*. 2018.

[18] L. Antanas, O. A. Can, J. Davis, L. De Raedt, A. Loutfi, A. Persson, A. Saffiotti, E. Unal, D. Yuret, and **P. Zuidberg Dos Martires**. "Relational Symbol Grounding through Affordance Learning: an Overview of the ReGround Project". In: *International Workshop on Grounding Language Understanding (GLU)*. 2017.

Extended Abstracts

[19] V. Verreet*, V. Derkinderen, **P. Zuidberg Dos Martires**, and L. De Raedt. "Inference and Learning with Model Uncertainty in Probabilistic Logic Programs". In: *Proceedings of the International Conference on Logic Programming (ICLP)*. 2022.

[20] **P. Zuidberg Dos Martires***. "Differentiation and Weighted Model Integration". In: *Workshop on Deep Continuous-Discrete Machine Learning (DecodeML)*. 2019.

[21] **P. Zuidberg Dos Martires***, V. Derkinderen, R. Manhaeve, W. Meert, A. Kimmig, and L. De Raedt. "Transforming Probabilistic Programs into Algebraic Circuits for Inference and Learning". In: *Program Transformations for Machine Learning*. 2019.

[22] **P. Zuidberg Dos Martires*** and S. Dumancic. "Reactive Probabilistic Programming". In: *International Conference on Probabilistic Programming (ProbProg)*. 2018.

Preprints

[23] I. Miosic* and **P. Zuidberg Dos Martires**. "Measure Theoretic Weighted Model Integration". In: *arXiv preprint arXiv:2103.13901* (2021).