

- Create and understand AI by focusing on the *interplay* between technology, humans and their situations.
- Work in AI problems with *structured* outputs given data and/or description of business and context.
- Research in AI algorithms that use existing algorithms and components for simpler AI problems.

EDUCATION

PHD, COMPUTER SCIENCE

Advisor: Prof. Hector Geffner
Universitat Pompeu Fabra
Dec 2009 | Barcelona/Spain

BS & MS, COMPUTER SCIENCE

Universidad Simón Bolívar, Venezuela

ACADEMIC WORK

- **Collaborated** on academic research leading to 20+ publications. (See list in next pages)
- Organized **workshops** at top AI conferences, including PRL-2020 on Planning and Reinforcement Learning ICAPS.
- **Reviewed** hundreds of articles submitted to top AI conferences (AAAI, IJCAI, ICAPS) and journals (AIJ, JAIR, KBS, ACM-TIST). SPC for IJCAI 2021.
- **Influenced** the AI planning community by helping to popularize the **translation-based approach**.

ACTIVISM / LEADERSHIP

- **Stimulated, coordinated and enabled** online activism for data crowdsourcing during natural disasters and elections.

PROGRAMMING

Extensive experience with • Python • Java
• C/C++ • Functional languages • Linux
• Computer clusters • Docker • Version control.

COMMUNICATION

- **Presented** original research at conferences. (See list in next pages).
- **Invited to talks** at Nasa Ames, Univ of Amsterdam, Univ of Sao Paulo.
- **Lectured** hundreds of hours to groups of up to 130 students on AI, logic, and computational logic.

TRAINING

Summer schools: • **Deep learning** 2017
• **Reinforcement learning** 2017.

LANGUAGES

- **English:** professional.
- **Spanish:** native.
- **French:** elementary.

INDUSTRIAL ARTIFICIAL INTELLIGENCE

ELEMENT AI | Research Scientist

Sep 2020 – present | Montreal, Canada

- **Fundamental** research in AI reasoning and **NeuroSymbolic** methods.
- Autonomous **applied** research agenda while relevant to EAI Platform.

ELEMENT AI | Applied Research Scientist

Sep 2018 – Sep 2020 | Montreal, Canada

- **Reasoning on top of a ML model.** Without additional training, achieved double-digit absolute improvement in hard cases of a vision-related task, without losing good performing cases of the pure ML-based model.
- Consulted for internal customers and products about their **AI strategy**.
- **Question answering** by mapping natural language into **structured queries**. Clarified the scope for balancing expressivity and performance.
- Motivated and collaborated in development of **AI-based curation** of labelled data for the consensus of the crowd could be wrong.

NUANCE COMMUNICATIONS | Senior Research Scientist

Nov 2016 – Sep 2018 | Montreal, Canada

- Detect **intent similarity** of utterances by training TensorFlow Siamese Network using dense data. Recommended roadmap for the feature.
- **Question answering** on domain-specific content and no labelled data. Took ownership of project clarifying methodology, evaluation and scope. Used • Information retrieval • Word embeddings • Ontologies.

ACADEMIC ARTIFICIAL INTELLIGENCE

REASONING / SYMBOLIC AI | Given a description of the problem

- Central approach: translate AI problems into simpler AI ones.
- Solved rich **sequential decision making** problems featuring possible scenarios and effects of actions and observations.
- Used logic / probabilistic reasoning, compilation to logical circuits, combinatorial optimization, and search.

EMPIRICAL | Think, code, measure, analyze, repeat, report

- Designed and ran hundreds of **experiments** over hundreds of problems.
- Programmed **complex algorithms**, requiring millions of object instances.
- Turned **empirical observations** into theoretical results, and vice versa.

RESEARCH AWARDS | Papers & Competitions

- **IJCAI-JAIR Best Paper Prize 2012** to an “outstanding paper published in JAIR in the preceding five calendar years”.
- **Dissertation Awards** by the European C. Committee for AI (ECCAI) and the Int. Conference on Automated Planning and Scheduling (ICAPS).
- **Winner** of the Conformant track of the 5th International **Planning Competition** 2006 for # of problems solved given time limit.

ACADEMIC HISTORY

UNIVERSITAT POMPEU FABRA | Visiting Professor

Jan 2013 – Dec 2015 | Barcelona, Spain

UNIV. CARLOS III DE MADRID | Postdoctoral Scholar

Dec 2010 – Dec 2012 | Madrid, Spain

UNIVERSIDAD SIMÓN BOLÍVAR | Assistant Professor

2008 – 2010 | Caracas, Venezuela

PUBLICATIONS

PHD THESIS

- H Palacios. **Translation-based approaches to Conformant Planning**. Supervised by Prof. Hector Geffner. Dec 2009. Barcelona, Spain.
 - Honourable Mention at the **2009 Artificial Intelligence Dissertation Award** by the European Coordinating Committee for AI (ECCAI).
 - **2010 Best Dissertation Award** by the International Conference on Automated Planning and Scheduling (ICAPS).

JOURNAL ARTICLES

- V. Agrawal, J. Baier, K. Bekris, Y. Chen, A.S. d'Avila Garcez, P. Hitzler, P. Haslum, D. Jannach, E. Law, F. Lecue, L.C. Lamb, C. Matuszek, H. Palacios, B. Srivastava, L. Shastri, N. Sturtevant, R. Stern, S. Tellex, S. Vassos. **Reports of the AAAI 2012 Conference Workshops**. AI Magazine. 33(4): 119-126 (2012). ISSN 0738-4602.
- H. Palacios and H. Geffner. **Compiling Uncertainty Away in Conformant Planning Problems with Bounded Width**. Journal of Artificial Intelligence Research (JAIR). 35: 623-765. 2009. ISSN 1076-9757.
 - **IJCAI-JAIR Best Paper Prize 2012** to an “outstanding paper published in JAIR in the preceding five calendar years”.

PATENTS

- Preparing two patent applications combining machine learning and reasoning methods. Sep 2020.
- M. B. Do, H. Palacios, R. Zhou, L. Kuhn, J. de Kleer. **Methods and Systems for Active Diagnosis through Logic-based Planning**. Patent US8145334. Issue date: 27 Mar 2012.
 - During internship at PARC (formerly Xerox PARC).

EDITOR

- Papers from the 2012 AAAI Workshop “Problem Solving Using Classical Planners”. H. Palacios, P. Haslum, J. Baier. 98 pp. 2012. ISBN 978-1-57735-577-9.
- Proceedings of the ICAPS’10 workshop on Planning and Scheduling Under Uncertainty (13 May 2010), Bidot J., Bryce D., Buffet O., Palacios H., Sanner S. (Editors). 2010.

REFEREED CONFERENCE ARTICLES

- K. Fernandes, J.S. Cardoso, H. Palacios. **Learning and Ensembling Lexicographic Preference Trees with Multiple Kernels**. 2016 International Joint Conference on Neural Networks (IJCNN 2016).
- S. Jimenez, A. Jonsson, H. Palacios. **Temporal Planning With Required Concurrency Using Classical Planning**. 25Th International Conference on Automated Planning and Scheduling (ICAPS). Jerusalem, Israel. June 7-11, 2015.
- C. Boutilier, J. Lang, J. Oren, H. Palacios. **Robust Winners and Winner Determination Policies under Candidate Uncertainty**. Twenty-Eighth AAAI Conference on Artificial Intelligence (AAAI). July 27-31, 2014. Québec, Canada.
- A. Albore, H. Palacios and H. Geffner. **Compiling Uncertainty Away in Non-Deterministic Conformant Planning**. European Conference on Artificial Intelligence (ECAI), p. 465-470. ISBN 978-1-60750-605-8. Lisbon, Portugal, August 16-20, 2010.
- J. Hoffmann, N. Fates, H. Palacios. **Brothers in Arms? On AI Planning and Cellular Automata**. European Conference on Artificial Intelligence (ECAI). p. 223-228. ISBN 978-1-60750-605-8. Lisbon, Portugal. August 16-20, 2010.
- B. Bonet, H. Palacios and H. Geffner. **Automatic Derivation of Finite-State Machines for Behavior Control (Nectar Track)**. 24th AAAI conference on Artificial Intelligence (AAAI), p. 1656-1659. ISBN 978-1-57735-463-5. Atlanta, Georgia, USA, July 11-15, 2010
- B. Bonet, H. Palacios and H. Geffner. **Automatic Derivation of Memoryless Policies and Finite-State Controllers Using Classical Planners**. 19th International Conference on Automated Planning and Scheduling (ICAPS), p. 34-41. ISBN 978-1-57735-406-2. Thessaloniki, Greece, September 19-23, 2009.
- A. Albore, H. Palacios and H. Geffner. **A Translation-based Approach to Contingent Planning**. Int. Joint Conf. on Artificial Intelligence (IJCAI), p. 1623-1628. ISBN 978-1-57735-426-0. Pasadena, California, USA, July 11-17, 2009.
- A. Albore, H. Palacios and H. Geffner. **Fast and Informed Action Selection for Planning with Sensing**. In Current Topics in Artificial Intelligence, vol 4788/2007. Selected papers of the 12th Conference of the Spanish Association for Artificial Intelligence (CAEPIA), p. 1-10. ISBN: 978-3-540-75270-7. Salamanca, España. November 12-13, 2007.
- H. Palacios and H. Geffner. **From Conformant into Classical Planning: Efficient Translations That May be Complete Too**. In Proceedings of the 17th International Conference on Automated Planning and Scheduling (ICAPS), p. 264-271. ISBN 978-1-57735-344-7. Providence, Rhode Island, USA, September 22-26, 2007.
 - Best Student Paper Award at ICAPS 2007.
- H. Palacios and H. Geffner. **Compiling Uncertainty Away: Solving Conformant Planning Problems Using a Classical Planner (Sometimes)**. In Proceedings of the 21st National Conference on Artificial Intelligence (AAAI), p. 900-905. ISBN 978-1-57735-281-5. Boston, Massachusetts, USA, July 16-20, 2006.
- H. Palacios and H. Geffner. **Mapping Conformant Planning into SAT through Compilation and Projection**. In Lecture Notes in Computer Sciences, vol 4177/2006. Selected papers of the 11th Conference of the Spanish Association for Artificial Intelligence (CAEPIA), 2005. p. 311-320. ISBN 3-540-45914-6. Santiago de Compostela, España, November 16-18, 2005.

– Best Paper Finalist at CAEPIA 2005.

- H. Palacios, B. Bonet, A. Darwiche, H. Geffner. **Pruning Conformant Plans by Counting Models on Compiled d-DNNF Representations**. In Proceedings of the 15th International Conference on Automated Planning and Scheduling (ICAPS), 2005. p 141-150. ISBN 978-1-57735-220-4. Monterey, California, USA. June 5-10 2005.
- H. Palacios and H. Geffner. **Planning as Branch and Bound: A Constraint Programming Implementation**. In Proceedings of the 28th Latin-American Conference on Informatics (infoUYclei), 2002. p. 239-251. ISBN 9974-7704-1-6. Montevideo, Uruguay, November 25-29 2002.

REFEREED WORKSHOPS ARTICLES

- D. Furelos-Blanco, A. Jonsson, H. Palacios, S. Jimenez. **Forward-Search Temporal Planning with Simultaneous Events**. ICAPS Workshop on Constraint Satisfaction Techniques for Planning and Scheduling, 2018.
- H. Palacios, A. Albore, H. Geffner. **Compiling Contingent Planning into Classical Planning: New Translations and Results**. In Proceedings of the Workshop “Models and Paradigms for Planning under Uncertainty: a Broad Perspective”, ICAPS 2014.
- C. Boutilier, J. Lang, J. Oren, H. Palacios. **Robust Winners and Winner Determination Policies under Candidate Uncertainty**. Fourth International Workshop on Computational Social Choice, 2012.
- H. Palacios and H. Geffner. **Compiling Uncertainty Away: Solving Conformant Planning Problems Using a Classical Planner (Sometimes)**. In Proceedings of the Workshop on Planning Under Uncertainty and Execution Control for Autonomous Systems, ICAPS 2006.
- H. Palacios and H. Geffner. **Mapping Conformant Planning into SAT through Compilation and Projection**. In Proceedings of the 1st International Workshop on Quantification in Constraint Programming held during the International Conference on Principles and Practice of Constraint Programming (CP), 2005.