Fernando Zhapa-Camacho

PhD Student · Computer Science

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Education

King Abdullah University of Science and Technology *Thuwal, Saudi Arabia*

PhD Computer Science *2022 - present*

- Advisor: Robert Hoehndorf

King Abdullah University of Science and Technology *Thuwal, Saudi Arabia*

MS Computer Science *2020 - 2022*

- Thesis: Embedding Ontologies Using Category Theory Semantics
- Advisor: Robert Hoehndorf

Yachay Tech University *San Miguel de Urcuquí, Ecuador*

BE Information Technology *2014 - 2020*

- Cum laude
- Thesis: Development of a Tropical Algebraic Geometry package in the Haskell programming language.
- Advisor: Francesc Antón Castro

Publications

Selected

Robert Hoehndorf, Catia Pesquita, **Fernando Zhapa-Camacho**. 2025. Neuro-Symbolic AI in Life Sciences. Frontiers in Artificial Intelligence and Applications.

Jiaoyan Chen, Olga Mashkova, **Fernando Zhapa-Camacho**, Robert Hoehndorf, Yuan He, Ian Horrocks. 2025. Ontology Embedding: A Survey of Methods, Applications and Resources. IEEE TKDE.

Fernando Zhapa-Camacho, Robert Hoehndorf. 2025. Lattice-Based ALC Ontology Embeddings With Saturation (Extended Version). Neurosymbolic Artificial Intelligence.

Fernando Zhapa-Camacho, Robert Hoehndorf. 2024. Lattice-preserving ALC ontology embeddings. NeSy 2024.

Fernando Zhapa-Camacho, Zhenwei Tang, Maxat Kulmanov, Robert Hoehndorf. 2024. Predicting protein functions using positive-unlabeled ranking with ontology-based priors. ISMB 2024.

Fernando Zhapa-Camacho, Robert Hoehndorf. 2023. From axioms over graphs to vectors, and back again: evaluating the properties of graph-based ontology embeddings. NeSy 2023.

Fernando Zhapa-Camacho, Maxat Kulmanov, Robert Hoehndorf. 2023. mOWL: Python library for machine learning with biomedical ontologies. Bioinformatics, Volume 39, Issue 1.

Additional

Olga Mashkova, **Fernando Zhapa-Camacho**, Robert Hoehndorf. 2024. DELE: Deductive EL++ Embeddings for Knowledge Base Completion. Preprint.

Azza Althagafi, **Fernando Zhapa-Camacho**, Robert Hoehndorf. 2024. Prioritizing genomic variants through neuro-symbolic, knowledge-enhanced learning. Bioinformatics, Volume 40, Issue 5.

Olga Mashkova, **Fernando Zhapa-Camacho**, Robert Hoehndorf. 2024. Enhancing Geometric Ontology Embeddings for EL++ with Negative Sampling and Deductive Closure Filtering. NeSy 2024.

Fernando Zhapa-Camacho, Robert Hoehndorf. 2023. Evaluating Different Methods for Semantic Reasoning Over Ontologies. SemREC 2023.

Sarah M. Alghamdi, **Fernando Zhapa-Camacho**, Robert Hoehndorf. 2022. A-LIOn - Alignment Learning through Inconsistency negatives of the aligned Ontologies. The 17th International Workshop on Ontology Matching.

Maxat Kulmanov, **Fernando Zhapa-Camacho**, Robert Hoehndorf. 2021. DeepGOWeb: fast and accurate protein function prediction on the (Semantic) Web. Nucleic Acids Research.

Joseph R. González, **Fernando Zhapa-Camacho**, Oscar V. Guarnizo, Francisco Ortega-Zamorano. 2018. Successive Adaptive Linear Neural Modeling for Equidistant Real Roots Finding. ETCM 2018.

Preprints

Fernando Zhapa-Camacho, Robert Hoehndorf. 2025. Fully Geometric Multi-Hop Reasoning on Knowledge Graphs with Transitive Relations. Preprint.

Safana Bakheet, **Fernando Zhapa-Camacho**, Robert Hoehndorf. 2025. An inductive, supervised approach for predicting gene–disease associations using phenotype ontologies. Preprint.

Awards

2024 **Dean List of the CEMSE Division**, King Abdullah University of Science and Technology

2023 **Travel Fellowship BioHackathon Europe**, ELIXIR Europe

Winner of the Semantic Reasoning Evaluation Challenge, International Semantic Web Conference

2022 **Travel Fellowship BioHackathon Europe**, ELIXIR Europe

Presentations

Fernando Zhapa-Camacho. 2024. Spotlight paper presentation: Lattice preserving ALC ontology embeddings. NeSy 2024.

Maxat Kulmanov, Robert Hoehndorf, Sarah Alghamdi, Azza Althagafi, Sumyyah Toonsi, **Fernando Zhapa-Camacho**. 2023. Tutorial: Machine Learning with Ontologies. International Conference on Biomedical Ontology 2023.

Maxat Kulmanov, **Fernando Zhapa-Camacho**. 2023. Tutorial: mOWL - Machine Learning Library with Ontologies. BHMENA, 2023.

Sarah Alghamdi, Robert Hoehndorf, Maxat Kulmanov, Sumyyah Toonsi, **Fernando Zhapa-Camacho**. 2023. Tutorial: Machine Learning with Biomedical Ontologies. SWAT4HCLS, 2023.

Fernando Zhapa-Camacho. 2023. Spotlight paper presentation: From axioms over graphs to vectors, and back again: evaluating the properties of graph-based ontology embeddings. NeSy 2023.

Robert Hoehndorf, Maxat Kulmanov, Sumyyah Toonsi, **Fernando Zhapa-Camacho**, Sarah Alghamdi. 2022. Tutorial: Machine Learning with Biomedical Ontologies. SWAT4HCLS, 2022 (Virtual).

Fernando Zhapa-Camacho. 2020. Abstract presentation: Purely functional implementation of a tropical geometry system in Haskell. CASC 2020, (Virtual).

Fernando Zhapa-Camacho. 2019. Workshop presentation: Development of a Tropical Algebraic Geometry package in the Haskell programming language. Queen Mary University of London, 2019.

Fernando Zhapa-Camacho. 2018. Paper presentation: Successive Adaptive Linear Neural Modeling for Equidistant Real Roots Finding. ETCM, 2018.

Teaching Experience

Spring 2025 **CS249 Algorithms in Bioinformatics**, Graduate Teaching Asistant

Spring 2025 **CS321 Application of AI in Bioinformatics**, Graduate Teaching Asistant

Fall 2023 **CS220 Data Analytics**, Graduate Teaching Asistant

Fall 2022 **CS249 Algorithms in Bioinformatics**, Graduate Teaching Asistant

Fall 2021 **CS220 Data Analytics**, Graduate Teaching Asistant

Spring 2019 **Functional Programming**, Undergraduate Teaching Asistant

Fall 2017 **Probability and Statistics**, Undergraduate Teaching Asistant

Software Projects

- **mOWL:** A Python library for machine learning with ontologies. Lead developer.

Technical Skills

- **Programming Languages:** Python, Java, Scala
- **Tools:** Git, W&B
- **Libraries:** PyTorch, OWLAPI

Outreach and Extracurricular Activities

Service and Outreach

2022 - 2024 **Yachay Tech Alumni Association**, Committee Member

Peer Review

Bioinformatics
Journal of Biomedical Semantics
PLOS ONE
International Conference on Neural-Symbolic Learning and Reasoning
European Conference on Artificial Intelligence
AAAI Fall Symposium Series
Neurosymbolic Artificial Intelligence