

# Fernando Zhapa-Camacho

PHD STUDENT · COMPUTER SCIENCE

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## Education

### King Abdullah University of Science and Technology

PHD COMPUTER SCIENCE

Thuwal, Saudi Arabia

2022 - present

- Advisor: Robert Hoehndorf

### King Abdullah University of Science and Technology

MS COMPUTER SCIENCE

Thuwal, Saudi Arabia

2020 - 2022

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

### Yachay Tech University

BE INFORMATION TECHNOLOGY

San Miguel de Urcuquí, Ecuador

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

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- 2025 **Dean List of the CEMSE Division**, King Abdullah University of Science and Technology
- 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

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**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

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- Spring 2025 **CS249 Algorithms in Bioinformatics**, Graduate Teaching Assistant
- Spring 2025 **CS321 Application of AI in Bioinformatics**, Graduate Teaching Assistant
- Fall 2023 **CS220 Data Analytics**, Graduate Teaching Assistant
- Fall 2022 **CS249 Algorithms in Bioinformatics**, Graduate Teaching Assistant
- Fall 2021 **CS220 Data Analytics**, Graduate Teaching Assistant
- Spring 2019 **Functional Programming**, Undergraduate Teaching Assistant
- Fall 2017 **Probability and Statistics**, Undergraduate Teaching Assistant

## Software Projects

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

## Technical Skills

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

## Outreach and Extracurricular Activities

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### 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