Víctor Toscano Durán

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About me

I am a passionate data scientist with a solid academic background and experience in the field of mathematics and artificial intelligence. I hold a degree in Statistics and a master's in Computer Science and Artificial Intelligence, backed by approximately two years of experience as a Data Scientist. Currently, I am immersed in the exciting world of doctoral research, working towards obtaining my PhD in Mathematics and AI at the University of Seville. I am an active member of CIMAGROUP, a group of researchers where we collaborate on innovative projects and contribute to the advancement of science and technology. My focus goes beyond mere knowledge acquisition; I am a person committed to continuous learning and constant improvement. My enthusiasm for mathematics and AI is reflected in my dedication to challenging projects and my ability to tackle complex problems with innovative solutions.

Work Experience

December 2023 – Current	**Researcher.** Applied Mathematics I department, University of Seville. Pre-doctoral researcher under the European project REXASI-PRO (HORIZON-CL4-HUMAN-01 programme under grant agreement no.101070028). I am involved in two tasks: Task T6.2 and Task 6.3. In T6.2, I am contributing to the optimization of energy consumption in a machine learning model used for pedestrian detection. The focus is on developing a topology-based approach to reduce input data during training while maintaining model performance. In T6.3, I am contributing on optimizing robot fleet behavior using topological methods. Our aim is to enhance the reliability of the fleet model and predict secure routes for wheelchair displacement. We employ tools like persistent homology and persistent entropy to analyze spatial relations and detect phase transitions in fleet behavior.
December 2022 – December 2023	**Machine Learning Scientist.** Igluco Tech. Development of deep learning models for blood glucose prediction. I also worked on data analysis and creating reports and visualizations.
September 2022 – December 2022	**Software Developer.** Solera. Software and test development in Java and Python
January 2022 – March 2022	**Data Scientist.** FISEVI. I was working on the development of data analysis, including data import, data cleaning and data cleansing, applying statistical techniques. Also developing an automated library for time saving and also in the production of reports.

Education

2024 – Current	**PhD in Mathematics**, University of Seville. Research line: Topological Data Analysis for Trustworthy AI.

Education (continued)

2022 – 2023   **Master's Degree in Logic, Computation and Artificial Intelligence.** University of Seville.
Thesis title: *Applications of artificial intelligence in predicting blood glucose levels using non-invasive techniques.*

2018 – 2022   **Bachelor's Degree in Statistics.** University of Seville
Thesis title: *Statistical indicators associated to the living conditions survey..*

Languages

Spanish   Native.

English   Overall B2 Listening C Reading B2 Writting B2 Speaking B2.

Achievements

- Participation in the ETSII Research Days (JIETSII 2024) with the presentation "Topological Data Analysis for Trustworthy Artificial Intelligence".
- Participation in the GATMAID EMS Summer School, organized by the Centre de Recerca Matemàtica from June 25 to 29, 2024. A poster titled "Representative measure approach to assess decision trees reliability" was presented.
- Participation in the Centre for Topological Data Analysis 2024 conference, organized by the University of Oxford. A poster titled "Representative measure approach to assess decision trees reliability" was presented.
- Participation in The 2nd World Conference on eXplainable Artificial Intelligence. Oral presentation on the paper published in this conference, and a poster on the thesis.
- NVIDIA DLI Certificate - "Fundamentals of Accelerated Data Science". Credential ID Jkg8E3DnSZu7hLnQfgBLDQ.
- NVIDIA DLI Certificate - "Fundamentals of Deep Learning". Credential ID T0LN84tLTUKly-6eRmtGqA.

Networks and Memberships

2023 – Current   **Team member of the Combinatorial IMage Analysis research group.** University of Seville.

Member of the work team of the "Topología Computacional para el ahorro de energía y la optimización de métodos de aprendizaje profundo para alcanzar soluciones verdes de Inteligencia Artificial" project (TED2021-129438B-I00). University of Seville.

Member of the work team of the "REliable & eXplAinable Swarm Intelligence for People with Reduced mObility" european project ((REXASI-PRO, GRANT AGREEMENT NO.101070028)). University of Seville.

Research Publications

Scientific preprints

[1] J. Perera-Lago, **Víctor Toscano-Durán**, E. Paluzo-Hidalgo, S. Narteni, and M. Rucco, "Application of the representative measure approach to assess the reliability of decision trees in dealing with unseen vehicle collision data," in *2156 - 978-3-031-63803-9, pp. 384 - 394. Springer Nature Switzerland, 10/07/2024. ISSN 2193-1801, ISBN 978-3-031-63803-9.* DOI: 10.1007/978-3-031-63803-9_21.

2 J. Perera-Lago, **Victor Toscano-Durán**, R. González-Díaz, E. Paluzo-Hildalgo, M. Á. Gutiérrez-Naranjo, and M. Rucco, "An in-depth analysis of data reduction methods for sustainable deep learning," . 4 - 101, Open Research Europe, 18/09/2024. ISSN 2732-5121, 2024. ⊘ DOI: `10.12688/openreseurope.17554.2`.

References

Rocío González Díaz   🔖 Full Professor, University of Seville, `rogodi@us.es`.

Miguél Ángel Gutiérrez Naranjo   🔖 Assistant Professor, University of Seville, `magutier@us.es`.