Richard Torres Molina

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Education

Virginia Tech — **Blacksburg, United States**
- Master of Science in Computer Science and Applications, **4.0** — Fall 2022 – Spring 2024
- **Thesis:** Utilizing Machine Learning Methods for Usability Evaluation in Learning Management Systems

University of St Andrews — **St Andrews, United Kingdom**
- Erasmus Mundus Joint Master of Science in Advanced Systems Dependability, **Merit** — Fall 2020 – Spring 2022
- **Theme:** Software Engineering and Machine Learning
- **Thesis:** Scheduling Surgeries in a Hospital

University of Lorraine — **Nancy, France**
- Erasmus Mundus Joint Master of Science in Advanced Systems Dependability, **Merit** — Fall 2021 – Spring 2022
- **Theme:** Formal Methods for Software Systems
- **Thesis:** Deep Reinforcement Learning for Road Traffic Control

Huawei — **Shenzhen, China**
- Certificate in Information Technology by Seeds for the Future Scholarship — Winter 2019

Beijing Language and Culture University — **Beijing, China**
- Certificate in Chinese Language and Literature — Winter 2019

Yachay Tech University — **Imbabura, Ecuador**
- Bachelor of Science in Information Technology, **9.4/10**, **Magna Cum Laude** — Fall 2014 - Spring 2019
- **Thesis:** Non-predictive and predictive models to recognize the learning style of the students: A case study

Teaching Experience

Whitman College — **Walla Walla, Washington**

Visiting Instructor in Computer Science — August 2024- Present
- Teach undergraduate students for the course CS270 Data Structures on C++ programming language.
- Create and teach the course CS302 Intelligent Systems for Sustainable Development Goals based on machine learning, software engineering, and human-computer interaction.
- Develop engagement content through slides, programming assignments, and scientific research for the courses CS270 and CS302.

Virginia Tech — **Blacksburg, United States**

Graduate Teaching Assistant — *August 2022 – May 2024*
- Grading assignments of **80+** undergraduate students for the course CS3704 Intermediate **Software Design** and **Engineering**.
- Tutor undergraduate students in **software design**, **Java**, **Git**, and **Spring**.
- Tutor undergraduate students in **Agile Scrum** methodologies.
- Provided detailed feedback on **Canvas** Learning Management System, contributing to a **10%** improvement in overall student performance.

Yachay Tech University — **Imbabura, Ecuador**

Teaching Assistant — *October 2018 – December 2018*
- Graded programming coursework of **32** undergraduate students enrolled for the course of **Artificial Intelligence**.

Research Experience

Virginia Tech — **Blacksburg, United States**

Graduate Researcher — *August 2022 – Present*
- Predicted usability with machine learning techniques on scikit-learn **(Python)** and user interactions from **Moodle** Learning Management System.
- Configured **Moodle** and set up on **Amazon Web Services**.
- Designed a use case study about **software engineering** on **Moodle** tested with **80+** undergraduate students.

University of St Andrews — **St Andrews, United Kingdom**

Software Researcher — *January 2021 – July 2021*
- Designed a framework for the **optimization** of the surgery schedule in a Brazilian hospital.

- Implemented a solution that works together with the **Java Artificial Intelligence** constraint solver (**OptaPlanner**), **Hibernate**, **Quarkus** and **Flask**.
- Predicted the surgery duration with **neural networks scikit-learn (Python)** trained with **data** of **~22K** surgeries.
- Developed a **user interface** in **Java** to visualize the scheduling process.

CentraleSupélec **Nancy, France**
Research Assistant *March 2022 – July 2022*

- Developed a framework for traffic light control with **reinforcement learning** (Artificial Intelligence).
- Design a use case simulation with **500** and **3k**+ vehicles on **SUMO** (Simulation of Urban MObility) and **PyTorch (Python)**.
- Worked in collaboration with the research laboratory Loria and a French startup.

Yachay Tech University **Imbabura, Ecuador**
Research Assistant *October 2017 – December 2017*

- Researched the implementation of Ritt-Wu's **algorithm** in **Haskell**, in collaboration with a team of **eight** people.
- Used the functional paradigm programming to solve systems of polynomial equations.

Research Assistant *October 2016 – January 2017*

- Created different questionnaires in **MAPLE T.A.** about mathematical topics that included functions, domain, range, etc.
- Delivered it to be part of the learning structure for **200+** junior students at Yachay Tech.

Work Experience

Esmarthu Research Group **Imbabura, Ecuador**
Founder and Software Engineer *September 2019 – August 2020*

- Led the development of an EdTech platform for **K-12 students** evaluated with **600+ students**.
- Developed four mathematical games on **Unity** for automatic learning style recognition with **machine learning** techniques.
- Participated in national and international startup competitions.

Logio s.r.o **Prague, Czech Republic**
Software Engineer Intern *June 2018 – August 2018*

- Selected as an intern by the International Association for the Exchange of Students for Technical Experience (**IAESTE**) hosted by the company **Logio s.r.o**.
- Implemented an application using the **Java Artificial Intelligence** constraint solver, **OptaPlanner** to **optimize** the transport in Prague.
- Followed **Agile Scrum** methodologies.

Theses and Publications

- **Torres, R.,** Seyam, M.: The Intersection of Usability Evaluation and Machine Learning in Software Systems, IEEE CogMI 2023, **United States** (2023).
- **Torres, R.**, "Scheduling surgeries in a hospital," M.S. Thesis, School of Computer Science, University of St Andrews, **United Kingdom** (2021).
- **Torres, R.**, "Deep Reinforcement Learning for Road Traffic Control," M.S. Thesis, Faculty of Science and Technology, University of Lorraine, **France** (2022).
- **Torres, R.**, Bustamante, C., Ríofrio, A., Quinga, F., Guachi, R., Guachi, L.: Brain Tumor Classification Using Principal Component Analysis and Kernel Support Vector Machine. In: H. Yin et al. (Eds.): IDEAL 2019, LNCS, vol. 11872. Springer, **Switzerland** (2019). https://doi.org/10.1007/978-3-030-33617-2_10.
- **Torres, R.**, Banda, J., Guachi, L.: Artificial Neural Networks in Mathematical Mini-Games for Automatic Students' Learning Styles Identification: A First Approach. In: H. Yin et al. (Eds.): IDEAL 2019, LNCS, vol. 11872. Springer, **Switzerland** (2019). https://doi.org/10.1007/978-3-030-33617-2_6.
- **Torres, R.**, "Non-predictive and predictive models to recognize the learning style of the students: A case study," B.S. Thesis, School of Mathematical and Computational Sciences, Yachay Tech University, **Ecuador** (2019).
- **Torres, R.**, Guachi, L., Guachi, R., Stefani, P., Ortega, F.: Learning Style Identification by CHAEA Junior Questionnaire and Artificial Neural Network Method: A Case Study. In: 1st International Conference on Advances in Emerging Trends and Technologies. Springer, **Ecuador** (2019. https://doi.org/10.1007/978-3-030-32033-1_30.

- **Torres, R.**, Ríofrio, A., Bustamante, C., Ortega, F.: Prediction of Learning Improvement in Mathematics through a Video Game using Neurocomputational Models. In: Proceedings of the 11th International Conference on Agents and Artificial Intelligence, pp. 554-559. SciTePress, **Czech Republic** (2019). https://doi.org/10.5220/0007348605540559.

Presentations

Oral Presentations

- **Torres, R.,** Seyam, M.: The Intersection of Usability Evaluation and Machine Learning in Software Systems, IEEE CogMI 2023, **United States** (2023).
- **Torres, R.**, "Scheduling surgeries in a hospital," M.S. Thesis, School of Computer Science, University of St Andrews, **United Kingdom** (2021).
- **Torres, R.**, "Deep Reinforcement Learning for Road Traffic Control," M.S. Thesis, Faculty of Science and Technology, University of Lorraine, **France** (2022).
- **Torres, R.**, "Non-predictive and predictive models to recognize the learning style of the students: A case study," B.S. Thesis, School of Mathematical and Computational Sciences, Yachay Tech University, **Ecuador** (2019).
- **Torres, R.**, Guachi, L., Guachi, R., Stefani, P., Ortega, F.: Learning Style Identification by CHAEA Junior Questionnaire and Artificial Neural Network Method: A Case Study. In: 1st International Conference on Advances in Emerging Trends and Technologies. Springer, **Ecuador** (2019).

Poster Presentations

- **Torres, R.**, Ríofrio, A., Bustamante, C., Ortega, F.: Prediction of Learning Improvement in Mathematics through a Video Game using Neurocomputational Models. In: Proceedings of the 11th International Conference on Agents and Artificial Intelligence, pp. 554-559. SciTePress, **Czech Republic** (2019).
- **Torres, R.**, "Scheduling surgeries in a hospital," M.S. Thesis, Depend Summer School 2021, Maynooth University, **Ireland** (2021).
- **Torres, R.**, "Deep Reinforcement Learning for Road Traffic Control," M.S. Thesis, Depend Summer School 2022, Maynooth University, **Ireland** (2022).

Honors and Awards

- 2024: Professional development grant to attend the international conference **Frontiers in Education 2024** awarded by **Whitman College**.
- 2022 – 2024: Full tuition **scholarship** offered by the Department of Computer Science at **Virginia Tech** for academic excellence.
- 2024: Startup Hokies incubator grant for the project Turyn awarded by **Apex Center for Entrepreneurs**.
- 2023: **National Science Foundation** Travel award for IEEE CogMI 2023.
- 2023: **Scholarship** for the Richard Tapia Celebration of Diversity in **Computing** Conference.
- 2022 – 2023: Selected among 1000 students worldwide in the **AWS AI & ML Scholarship** program by **Udacity**.
- 2020 – 2022: **Merit** in the program **Erasmus Mundus** Joint Master of Science in Advanced Systems Dependability.
- 2020 – 2022: **Erasmus Mundus scholarship ($48.000)** offered by the **European Commission**.
- 2020: Selected as one of the recipients for the **Fulbright scholarship** (United States) for academic excellence, declined, covid-19.
- 2020 - Selected as one of the **100 youth leaders** from South America in the program "Comprometidos 2020" organized by **UNESCO** (**Uruguay**).
- 2019 – **"Seeds for the Future"** scholarship (Ecuador-China) in Information Technology and Chinese Language.
- 2019 - **First place** in the contest **"Seeds for the Future"** (Ecuador-China) with the research project **Esmarthu**.
- 2019 - **Best Graduate (Highest GPA)** of the School of Mathematical and Computational Science at **Yachay Tech University**.
- 2019 - Finalist in the entrepreneurship and innovation award **"National Youth Award"** in Ecuador with the project **Smart Math**.
- 2019 - Between the 12 startups in the international competition, **Entrepreneurship World Cup** in Ecuador with the project **Smart Math**.
- 2019 - School of Mathematical and Computational Science **International Travel for Scholarly Presentations Award ($1.870)**, Yachay Tech University.
- 2018 - Best User Interface at International **TuApp.org contest** with the mobile application "Smart Math" in **Peru**.
- 2017 - School of Mathematical and Computational Science **International Travel Internship Abroad Award ($1.400)**, Yachay Tech University.
- 2014 - 2019 - **President's Scholarship "Eloy Alfaro" ($18.000)** for academic excellence in Ecuador.

Service and Outreach

- Scholar at Richard Tapia Celebration of Diversity in Computing conference — Fall 2023
- IEEE Student Member — Fall 2023
- Scholar at Seeds for the Future with young innovators from Ecuador, Bulgaria, and Serbia — Winter 2019
- Mentor and teach K-12 students in a rural community in Ecuador — Summer 2017

Skills

Languages and tools: Java, Python, MySQL, HTML, LaTeX, Git, Spanish (Native), French (Basic knowledge), Linux and Microsoft

Research Interests: Software Engineering, Machine Learning, Human-Computer Interaction