# Javier Páez Franco

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## Education

**Delft University of Technology** Sep. 2021 – July 2024

*B.Sc. Computer Science and Engineering* *Delft, Netherlands*

- **Grade**: Cum Laude with Honours
- **Relevant courses**: Minor in Robotics, Machine Learning, Computational Intelligence, Algorithm Design, Software Engineering Methods

**CERN IdeaSquare Summer School** May 2023 - July 2023

*Summer Programme* *Delft, Netherlands - Geneva, Switzerland*

- Selected as one of the 20 students from the leading universities in the Netherlands.
- Collaborated with an interdisciplinary team to create UltraGPU, which is 50% more energy-efficient and has a 5000% longer lifespan than typical GPUs, significantly accelerating neural network training.

## Research Experience

**Bio-inspired Navigation of Multi-Agent Systems in Extreme Environments** Nov. 2023 - July 2024

- Researched state-of-the-art bio-inspired algorithms for path planning in extreme environ, with the guidance of Professor Raj Thilak Rajan.
- Developed a unified framework to compare these algorithms based on a set of metrics: reachability, path length, and planning time.

**Distributed Algorithm to Maximize the Lifetime of a Swarm of Rovers** Jan. 2023 – Oct. 2023

- In collaboration with Lunar Zebro, a team developing cutting-edge lunar rover technology, I created a distributed algorithm aimed at maximizing the lifespan of a swarm of lunar rovers throughout a mission lasting 14 days.
- Successfully devised a game-theory-based algorithm using ROS. A paper discussing the algorithm in detail has been submitted.

**How Educational Techniques Foster Creativeness and Innovative Thinking** Jun. 2023 – Oct. 2023

- Written a paper in collaboration with CERN, discussing how diverse educational tools and techniques foster creativeness and innovative thinking among students. The paper has been submitted to the CERN IdeaSquare Journal of Experimental Innovation (CIJ).

## Work experience

**SHV Energy - Industrial robot** Sep. 2023 - Feb. 2024

*Robotics Engineer* *Delft, Netherlands*

- Led an interdisciplinary team of 6 students to design, assemble and build an industrial robot to autonomously load and unload LPG cylinders from a telescopic chain conveyor to a truck.
- Reduced the manual handling risk by loading and unloading over 1200 cylinders per hour.
- Leveraged Computer Vision and LiDAR technology to accurately detect LPG cylinders on the conveyor belt and avoid obstacles.

**Your Next Agency - Project Monitoring Dashboard SaaS** May 2023 – July 2023

*Software Engineer Intern* *Amsterdam, Netherlands*

- Led a team of 5 people as the scrum master, to develop a management dashboard SaaS application.
- Reduced manual labour in project creation and user management by automating 70% of the steps. As a result, the application has become the primary company portal for project management.
- Implemented using PHP, Laravel, TypeScript, Node.js, AWS, and PostgreSQL.
- Created unit and integration tests using Selenium and Mocha, achieving over 95% code coverage.

**Panacea Cooperative Research - Skeleton ID** July 2022 – Sep. 2022

*Software Engineer Intern* *Ponferrada, Spain*

- Actively developed Skeleton-ID, a forensic identification software powered by Deep Learning. Collaborated closely with anthropologists and researchers, providing essential support to drive successful project outcomes.
- Demonstrated first-hand knowledge of research methodology through active involvement in multiple research initiatives.
- Developed a comparative dental analysis tool using Kotlin, Spring Boot, PostgreSQL, TypeScript, and Angular.

## Projects

**Double Q-Learning algorithm for maze solving** | *Python, NumPy* March 2023 - April 2023

- Developed a Double Q-learning algorithm with $\varepsilon$-Greedy action selection and epsilon decay from scratch, without using any machine learning libraries or frameworks.
- The algorithm can successfully find the exit of randomly generated mazes.

**Artificial Neural Network (ANN)** | *Python, NumPy* Feb. 2023 - March 2023

- Developed an ANN from scratch, without using any deep learning libraries or frameworks.
- Achieved a success rate of 93%, accurately classifying inputs of ten features into one of seven classes.
- Feedforward neural network trained with backpropagation, using RELU and Softmax activation functions, as well as Cross-entropy loss, He initialization, L2 regularization, dropout, early stopping, and Adam optimization.

**Delivery Service App** | *Java, Spring, Mockito, Gradle, SQL* Nov. 2022 – Jan. 2023

- Developed a highly scalable and modular food delivery platform that seamlessly connects restaurants with customers. The system offers a wide range of features, including discount options, allergy filtering, and flexible cancellation policies, to enhance the overall shopping experience.
- Implemented robust user authentication and secure password storage using Spring Security to ensure system integrity.
- Acquired a comprehensive understanding of microservice architecture and its benefits for large-scale applications.

## Certifications

- **ROS1x: Hello (Real) World with ROS – Robot Operating System:**

## Volunteering

**Cooperation Bierzo–South NGO** Dec. 2017 – Dec. 2021

*Volunteer* *Ponferrada, Spain*

- Volunteered for four years with Cooperation Bierzo–South NGO, a non-profit association dedicated to driving social transformation in Sao Tomé y Príncipe.

## Activities and interests

**Krashna Musika** Oct. 2021 – July 2024

*First violinist* *Delft, Netherlands*

- First violin in Krashna Musika, the symphonic orchestra and choir of TU Delft. With over 200 members, Krashna Musika is one of the largest musical student associations in the Netherlands.
- Played concerts internationally, such as in Spain, The Netherlands, France, Germany, and Poland.

## Skills

**Programming languages**: Python, Java, Rust, Scala, C++, JavaScript, TypeScript, PHP, Kotlin, SQL, Bash
**Frameworks & Libraries**: Scikit-learn, ROS, PyTorch, Pandas, Spring, Spark, Angular, Node.js, JUnit, Selenium
**Developer Tools**: Git, Docker, Gradle, Maven, Unix, Ubuntu, Windows, LaTeX, JetBrains, VS Code
**Languages**: Spanish (Native), English (IELTS C1)