

JOSÉ MIGUEL ALFONSO ROJAS LABRA

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PROFESSIONAL PROFILE

Mechanical and Computer Engineer completing an MSc in Mechatronics, with strong experience in sensor integration, system modeling, and simulation-driven development. Experienced in multidisciplinary projects combining mechanical design, embedded systems, and data analysis. Skilled in Python-based simulation, ANSYS structural analysis, and validation of mechatronic systems.

RESEARCH & PROJECTS

COMPARATIVE PERFORMANCE ANALYSIS OF HAND MODELS WITH DIFFERENT OBLIQUE FLEXION CONFIGURATIONS

2025 - 2026

Master's Research Project and Paper, Chungnam National University

- Investigating the performance of various hand models with different oblique flexion configurations
- Developing simulations and analyses in Python to evaluate kinematics and grasping performance
- Writing a research paper based on the study; project currently in progress

FINITE ELEMENT ANALYSIS OF A 3D-PRINTED DENTAL TOOL

2026

Preliminary Research Project, Chungnam National University

- Conducted finite element analysis (FEA) of a 3D-printed dental tool in ANSYS Mechanical
- Compared material and geometry effects on deformation and stress distribution
- Validated simulation accuracy through mesh convergence analysis

AUTONOMOUS MOBILE ROBOT – SIMULATION IN WEBOTS

2023

Introduction to Robotics course project, Adolfo Ibáñez University

- Modeled and simulated a four-wheel autonomous mobile robot in Webots simulation environment
- Implemented PID-based motion control and sensor-driven navigation using distance sensor models
- Performed iterative parameter tuning and simulation-based validation to improve trajectory tracking and collision avoidance

AUTOMATED PACKAGE SORTING SYSTEM

2022

Simulation, Automation and Mechatronics course project, Adolfo Ibáñez University

- Designed and built a small-scale conveyor-based sorting system using stepper motor control
- Implemented color sensing and weight measurement to classify and route packages automatically
- Developed control logic to stop, scan, weigh, and direct packages to target ramps based on set rules

BIONIC ARM: HARDWARE-SOFTWARE INTEGRATION

2021 - 2023

Multidisciplinary engineering project, Adolfo Ibáñez University

- Led end-to-end system integration of a multi-domain mechatronic system combining mechanical design, embedded electronics, and real-time signal processing
- Developed closed-loop control strategy based on noisy EMG sensor input
- Implemented embedded microcontroller programming for actuator control
- Improved signal reliability through filtering and data-driven calibration

CONFERENCES

COMPARATIVE EVALUATION OF POWER GRASP SIMULATION IN HAND MODELS WITH VARYING OBLIQUE FLEXION CONFIGURATIONS

Apr 2026

Poster Presentation, The Korean Society of Mechanical Engineers (KSME), Yeosu, South Korea

- Presented research on finger joint biomechanics and grasping simulation to an academic audience
- Received feedback from experts in biomechanics and robotics, enhancing the study and methodology

HONORS & AWARDS

GLOBAL KOREA SCHOLARSHIP (GKS)

2023

Awarded by the National Institute for International Education (NIIED), South Korea

Full scholarship for graduate studies in South Korea, covering 1 year of intensive Korean language study followed by 2 years of Master's degree. Includes tuition, monthly stipend, and round-trip airfare. Highly competitive national award.

UNDERGRADUATE RESEARCH GRANT – TALLER DE INVESTIGACIÓN DIRIGIDA (TID)

2021

Faculty of Engineering and Sciences, Adolfo Ibáñez University, Chile

Competitive internal research grant awarded based on academic excellence and research proposal quality.

ACADEMIC HONOR SCHOLARSHIP

2019 – 2023

Adolfo Ibáñez University, Chile

Merit-based scholarship awarded to top-performing students (GPA > 5.95/7.00; approx. top 5.6% cohort).

EDUCATION

MSC. IN MECHATRONICS

2024 – 2026 (Expected)

Chungnam National University (CNU), South Korea

BACHELOR'S DEGREE IN ENGINEERING SCIENCES

2019 – 2023

Adolfo Ibáñez University (UAI), Chile

Major in Mechanical Engineering

Additional specialization in Computer Engineering (coursework completed 2025)

TEACHING EXPERIENCE

PROGRAMMING TUTOR, CUBO EDUCATIVO

2021

Introduction to programming with Scratch

Taught programming in Scratch to students of municipal schools, adapting explanations to different levels. Conducted interactive lessons that emphasized understanding of basic programming concepts, logical thinking, and problem-solving skills.

SKILLS

PROGRAMMING LANGUAGES

Python (Advanced) | R (Intermediate) | MATLAB (basic)

SIMULATION & ENGINEERING TOOLS

Autodesk Inventor | ANSYS | RecurDyn | Creo | Fusion 360 | MATLAB/Simulink

EMBEDDED SYSTEMS / IOT

Arduino | ESP32 | Raspberry Pi | Sensor Integration | PID Control | IoT prototyping

DATA ANALYSIS / TOOLS

Data cleaning | Data visualization | Statistical analysis | Machine learning (Python, R) | Excel

LANGUAGES

Spanish (native) | English (Full Professional Proficiency) | Korean (intermediate, TOPIK II Level 3)

COLLABORATION & LEADERSHIP

Agile/Scrum (Daily stand-ups, sprint planning, retrospectives) | Project coordination | Teaching assistance and student mentoring | Conference presentations

WORK PRACTICES & TOOLS

Notion | Trello | Jira | Experience in multicultural teams (Chile, South Korea)

OTHERS

Additive Manufacturing | LaTeX | Sensors and actuators | Basic electronics

TEACHING ASSISTANT (UAI)

PHYSICS III
2021

FLUIDS MECHANICS
2022

COMPUTATIONAL MECHANICAL DESIGN
2022, 2023

Mentored students in problem-solving sessions and exam preparation, helping them strengthen their understanding of core engineering concepts.

REFERENCES

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