# Igor Lucindo Cardoso

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## Professional Summary

- PhD student specializing in Operations Research, Mixed-Integer Programming (MIP), and Graph Theory.
- Published author with research focused on GPU-accelerated optimization and decision tree algorithms.
- Experienced in developing full-stack optimization tools using Python, CUDA, and Gurobi.

## Education

**Texas Tech University (TTU)** 2025 – Present
Ph.D. in Industrial Engineering GPA: 4.00/4.00

**Getulio Vargas Foundation (FGV)** 2023 – 2024
M.A. Courses in Mathematical Modeling

**Military Institute of Engineering (IME)** 2020 – 2024
B.S. in Electronic Engineering GPA: 8.25/10.00

## Publications

**Cardoso, I.**, Teodoro, G., Validi, H. (2026). **A Polytime and Interpretable Approach for Solving Wordle**. Submitted to *Operations Research*.

Gutierrez, R., **Cardoso, I.**, Validi, H. (2026). **Sport Scheduling to Minimize Travels at the FIFA World Cup 2026**. Submitted to *Optimization Letters*.

**Cardoso, I.**, et al. (2024). **Comparing Pre-Trained Object Detection Models for Autonomous Grasp on Affordable Prosthetic Hands**. *IEEE MeMeA*.

## Research Experience

**Research Assistant, Texas Tech University (TTU)** 2025 – Present

- Developing novel algorithms for NP-hard combinatorial problems, leveraging GPU acceleration and decomposition techniques to solve large-scale instances.
- Advisor: Dr. Hamidreza Validi.

**Research Experience for Undergraduates, Memorial University (MUN)** 2023

- Designed and implemented computer vision algorithms for autonomous robotic grasping, integrating deep learning models with real-time control systems.
- Advisor: Dr. Vinicius P. da Fonseca.

## Honors & Awards

- TTU Tye Industrial Endowment Engineering Scholarship 2026
- INFORMS Student Chapter Annual Award (Cum Laude) 2025
- 1st place, Shell Eco-marathon "The Road to 2050" 2021
- 5th place, Petrobras Challenge (RoboIME) 2021
- Gold Medal, Brazilian Math Olympiad (OBMEP) 2018

## Affiliations & Activities

- **INFORMS Student Chapter:** Active member engaging in seminars and collaborative research.
- **Journal Club Presenter:** Discussing and analyzing peer-reviewed research in Operations Research.
- **Previous Activities:** Robotics Club (RoboIME), Shell Eco-marathon Team.

## Software & Projects

**Wordle Optimization Solver** *Python, CUDA, Decision Trees*
GPU-accelerated solver achieving a theoretically optimal 3.42 average guesses. [View App]

**FIFA World Cup 2026 Scheduler** *Python, JS, MIP Solvers*
Interactive web app using MIP to optimize match scheduling and minimize travel. [View App]

**Expense Splitter** *Python, Linear Programming*
Optimization tool to minimize transactions required to settle shared expenses. [View App]

## Skills

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|---|---|
| Programming | Python, C/C++, Matlab, Julia, Java, JavaScript, HTML, CSS, FPGA |
| Tools | Gurobi, Cuda/GPU, Git, LaTeX, Linux, NetworkX, ROS, OpenCV, Arduino |
| Languages | Portuguese (native), English (fluent), French (intermediate) |