Summer Internship 2025-2026
Shipping Operations Research

Title: High performance simulation methods for supply chain optimization
Duration: December 1st 2025 - February 28th 2026
Objective: Investigation and implementation of an approximate dynamic programming algorithm and a gpu-powered simulation to optimize supply chain decisions
Modality: Hybrid - 1 day / week at Melicidade (Osasco-SP)
Areas of Interest: Algorithms and Optimization
Requirements: Proficiency in Python
Technical Leader: Eduardo Curcio

About the Project:

Mercado Libre is one of Latin America's largest e-commerce platforms, operating a vast supply chain network where products are received, stored, and distributed before being delivered to customers. One of its main challenges is deciding how many products Mercado Libre should receive from sellers in its supply chain network. Determining the right quantity of product to be received poses a significant computational challenge, as it involves optimizing multiple decisions in a complex environment with conflicting costs, risks of stockouts, uncertain demand, and multiple business rules that must be considered. Since these decisions must be made for hundreds of thousands of products, the computational efficiency of optimization algorithms is imperative. Therefore, the objective of this project is to study the possible benefits of implementing an approximate dynamic programming (ADP) algorithm and a GPU-powered simulation framework to optimize our supply decisions.

Duration Details: 12 weeks in total.

Tasks and Activities:

1) Technical Capacitation: familiarization with the problem, numba, our python module and technical platform.
2) In-depth study of the Mercado Livre's supply problem and ADP.
3) Theoretical formulation of the ADP for the Mercado Livre's supply problem.
4) Implementation of ADP algorithm and the new GPU-accelerated simulation method.
5) Computational experiments to assess impact and performance of the solution.
6) Final Report.
7) Seminar.

Activity Schedule:

	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12
(1)	X	X										
(2)		X	X	X								
(3)				X	X	X	X					
(4)						X	X	X	X	X	X	
(5)									X	X	X	
(6)											X	X
(7)												X

Benefits:

- *Monthly Payments:*
    - *Stipend:* R$ 3.600,00.
    - *Transportation Allowance:* R$ 800,00.
- An accident insurance will also be provided covering the entire period of the internship.