



Optilogistics: Revolutionizing Logistics with AI-Powered Solutions





About mlangles

mlangles is a comprehensive AI platform designed to manage the entire lifecycle of data and models, offering streamlined solutions for each stage of the process. It features two main modules: Predictive AI and Generative AI.

The Predictive AI module provides tools for efficient project development, including data engineering, deployment, and monitoring, with applications across healthcare, retail, logistics, and manufacturing.

The Generative AI module enables enterprises to customize large language models (LLMs) using their data for specific use cases. It offers a range of model sizes to meet different speed and cost requirements and supports the creation of LLM-based chatbots through user-friendly low-code/no-code features.

In summary, mlangles delivers a complete Al ecosystem to address diverse enterprise needs and challenges.





Introduction

In today's fast-paced logistics landscape, the final step of getting goods to its destination presents significant challenges. Issues like high delivery costs, lack of real-time visibility, inefficient route planning, and the unpredictability of traffic and weather all hinder timely and cost-effective deliveries. These challenges often lead to increased operational costs and customer dissatisfaction.

Optilogistics is designed to tackle these obstacles. Our solution improves delivery route optimization with real-time data, reduces fuel consumption, and enhances truck load efficiency, resulting in measurable reductions in operational costs and improved time-to-delivery.



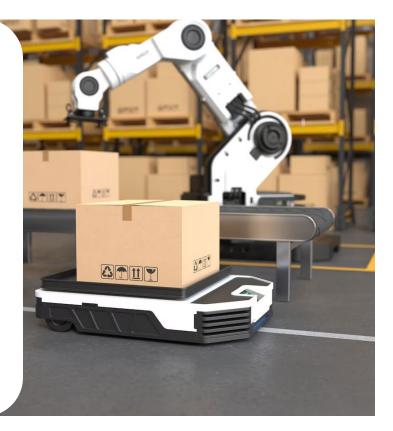




Al Solution Summary

Overview

Optilogistics integrates advanced AI technologies, including the HERE Tour Planning API for solving the Capacitated Vehicle Routing Problem (CVRP) and a bin packing algorithm for optimized truck loading. These are unified in a single API that is orchestrated by a Large Language Model (LLM). This design simplifies integration, offering flexibility across multiple industries, from e-commerce to supply chain logistics.





Key Benefits

The solution accelerates decision-making by automating route and load optimization, leading to faster time to insights. By minimizing delivery time, reducing fuel consumption, and optimizing space utilization in trucks, it significantly improves operational efficiency. Additionally, LLM-driven manifests provide dynamic, tailored delivery schedules, enhancing driver productivity.





Let's Take a Closer Look

How It Works:

3 EX E

 \mathbf{c}

Optilogistics operates by first processing truck and item data provided in Excel or JSON formats by the user.

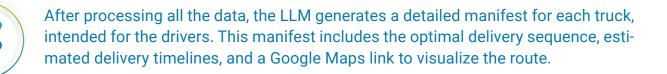
What the truck data should include-> fixed costs, costs per distance traveled, and time-based costs, shift schedules, including start and end times, capacity and dimensions of the truck containers and the truck's starting and ending locations.

What the item data should include-> the delivery location, the duration of the starting and ending time at which the item can be accepted at the delivery location and the dimensions and weight of each of the items. Here the item could be associated with a single stock keeping unit (SKU) or a group of items that are combined into a single box.

Now that the algorithm has what it needs, it goes to the next step which is data preprocessing for the HERE tour planning API and bin packing algorithm.

Once the data is processed, it is passed to a LangGraph agent. This agent has access to various tools and large language models (LLMs) and uses a chain of thought approach to generate LLM outputs and make tool calls. The key tools available to the agent include the HERE Tour Planning tool and the bin packing tool for route optimization and load management.

Based on an initial prompt and data provided to the LLM in the LangGraph agent, the AI system identifies that it needs to solve the Capacitated Vehicle Routing Problem (CVRP) using a bin packing algorithm to generate a manifest for each truck. First, the LLM activates the HERE Tour Planning tool, which utilizes the HERE Tour Planning API to solve the CVRP. The tool generates an optimal delivery sequence with timestamps for each delivery point assigned to the trucks. Additionally, it provides key statistics related to cost, time, and distance for both individual trucks and the overall operation.



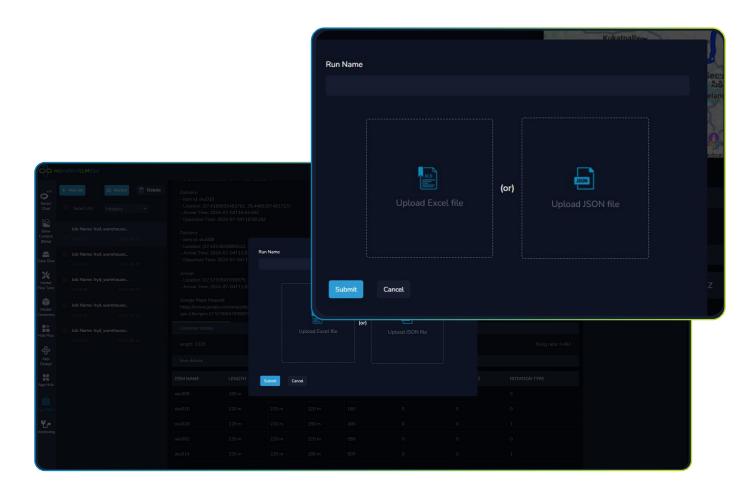




The User Journey

Creating a new Job:

Each new request sent to the Optilogistics API is referred to as a "job." To create a job, the user simply clicks on the "+New Job" button, provides a job name, uploads the truck input details in either Excel or JSON format, and submits the request.



Response to a given job:

Once a new job is created, the system processes the data and generates a response. This response includes a manifest for each truck, detailing the optimal delivery sequence and timelines. The manifest also provides an interactive map, allowing drivers to visualize their routes and delivery points. The user can view these details by accessing the job's response, which includes both the manifest and a link to the map for easy navigation and efficient route management.





c c m	alangles ILLMOps										ŵ	
¢	+ New Job 🖾 Monitor 🛅 Delete	hyd_warehouse1_30-0	08-2024									
Smart Chat		Uploaded file name :V	Varehouse1_300	82024.xlsx							AF	PI Response
Brew Content (Beta)	Job Name: hyd_warehouse 14:01:57 2024-09-20						O Thumukunta, Secund					
(Beta) Data Dive	Job Name: hyd_warehouse	- Departure Time: 202 Delivery:	4-07-04T10:48:36				Thumukunta, Secund More options	MAISAMMA	SHAMIRPET Post OT elangana, 500078	Ģ		
	13:42:20 2024-09-20 Job Name: hyd_warehouse	- Location: (17.41896) - Arrival Time: 2024-0	- Item H3:sku010 - Location (17:4188602463761.78:4485297481727) - Antval Time: 2024-07-04T10.54:562									
Fine Tune		- Departure Time: 202 Delivery:	4-07-04110:58:16			204	ເຮັ້ອງ ສາຍ	ALW BALANAGAR	DAMMAIGUDA చమ్మాయిగూడ	Ģ		
Model Compress	Job Name: hyd_warehouse 13:28:08 2024-08-11	- Location: (17.42148: - Arrival Time: 2024-0	- tem id. sku008 - Location: [17.5730947036975,78.56249951912998destination=17.5730947036975,78.562									
Hub Plus Hub Plus App Design	Job Name: hyd.warchouse 1318.22 2024-06-12	Arrival: - Location: (17.57309/ - Arrival Time: 2024-0 Google Maps Request https://www.google.cc										
App Store		Container details length: 1320				height: 300			filling ratio: 0.461			
الله من الم												
		ITEM NAME	LENGTH	WIDTH	HEIGHT	POSITION X	POSITION Y	POSITION Z	ROTATION TYPE			
		sku008										

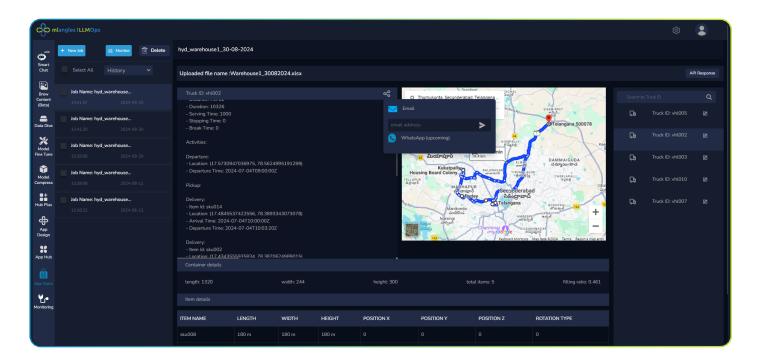
Additionally, the system also displays the loading sequence for each truck. This sequence outlines how items should be loaded based on the optimal delivery order, following the "First In, Last Out" principle. The image associated with the response visually represents the placement of items within the truck, ensuring efficient use of space and proper item orientation.

do 1	mlangles ILLMOps												
0	+ New Job	🖼 Monitor	聞 Delete	Delivery: - Item Id: sku010					More options	MAISAMMA (6-à	SHAMIAPET *2.5 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.6 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •2.7 •	Ç,	
Smart Chat				- Location: (17.418 - Arrival Time: 202	9602463761, 78.448 4-07-04T10:54:56Z 2024-07-04T10:58:16				Miyapur	រាស់ស្នា Kompally ទីកន្លែងខ្ល	Kog	G	
Brew Content	Job Name: hy	d_warehouse 2024-05		- Departure rime. Delivery: - Item Id: sku008				53 63	ు Miyapur మియాపూర్ Kukatpall Housing Board Colony	BALANAQAR	MAL DAMMAIGUDA പ്രച്ചായാന്ഗ്രംപ്പ് MAAGIRI	Ģ	
(Beta)		d_warehouse		- Location: (17.421 - Arrival Time: 202	4816890512, 78.455 4-07-04T11:02:15Z 2024-07-04T11:05:3!			1	ELLAPUR MA	OHAPUR ကေးသူကို Secunde Ofindey သီဒီဝင္ထာ	CHERLAPALLI Dgog Gha	Gə	
Model Fine Tune		2024-05 d_warehouse 2024-05			0947036975, 78.562 4-07-04T11:52:38Z	4995191299)			Rg Manik Sagar Sagar Sagar	onda soci	BODUPPAL Staboo ABERPET UPPAL UPPAL BODDA ABERPET BEOG BODUPPAL 100 100 100 100 100 100 100 100 100 10	G	
Model Compress		d_warehouse 2024-08		Google Maps Requ https://www.googl api=1&origin=17.5		524995191299&de		0947036975,78.5624	2008) 100-2-1	onGoogle	Dil Stuth HAD AR Ampagn3 Touts Map data #2024 Terms Report a map error		
Hub Plus	Job Name: hy	d_warehouse		Container details									
Hub Mus				length: 1320				height: 300		total items: 5	filling ratio: 0.461		
App Design													
App Hub				ITEM NAME	LENGTH	WIDTH	HEIGHT	POSITION X	POSITION Y	POSITION Z	ROTATION TYPE		
Ê				sku008									
App Store				sku010									
۳				sku018									
Monitoring				sku002									
				sku014				800					





In addition to the core functionality, we've incorporated several useful features into the Optilogistics API:





Monitoring:

Users can track the number of prompts, completions, and total tokens consumed by the LLM to execute each job. This can be done by selecting specific jobs and clicking on the "Monitor" option.



Delete:

Users can remove selected jobs by selecting them and clicking the "Delete" button, simplifying management.



History:

The history feature allows users to view all past jobs or filter by specific time frames, such as the last 30 or 90 days, or even within a custom date range, using the history dropdown.



Share:

At the top of the manifest, there is a "Share" option, enabling users to share job details with drivers via email or, in the future, WhatsApp.





M	lodify Del	veries For Truck ID:vhl002		×
	SELECT	PLACE	LATITUDE	LONGITUDE
		F9MQ+RP Hyderabad, Telangana, India	17.48455374225 56	78.389334307307 8
		3rd Floor, Tower, 1, #4, Software Units Layout, Madhapur, Hyderabad, Telangana 500081, India	17.43435559358 34	78.387062498901 5
		Lane, beside Lumbini Jewel Mall, opp. MayFair apartments, Venkateshwara Nagar, Aurora Colony, Banjara Hills, Hyderabad, Tel angana 500034, India	17.42607579424 42	78.435383536673 6
		Gvk One Mall, 6-3-251, Rd Number 1, Balapur Basthi, Banjara Hills, Hyderabad, Telangana 500082, India	17.41896024637 61	78.448529748172 7
- New Job A Monitor		Nnear Irrum manzil metro station, Irram Manzil Colony, Punjagutta, Hyderabad, Telangana 500082, India	17.42148168905 12	78.455015695735 5
art Stelect All History Setect All History Job Name hyd, warehouse Job Name hyd, warehouse Dw a state of the hyd state of the hy				Delete filling ratio
Job Name: hyd_warehouse 13.39.56 2024-09-20				
Set Job Name: hyd_warehouse		side Lumbhi Jewei Mall, opp. MayFair apartments. Verkateshwara Nagar, Aurora Colony, Banjara Hills, Hyderabad, Tel. 17.42607579424 78.435385556673	D: vhl010 👩	
Job Name: hyd_warehouse 13:18:22 2024-06-12			D: vhl007 😢	
		rum manzil metro station, Irram Manzil Colony, Punjagutta, Hyderabad, Telangana 500082, India 17,42148168905 78 455015695735 12 5		
		Wedth: 244 height: 300 total Rems: 5 Milling table: 0.461		
pring				

Edit Details:

Users can modify truck details after the optimization process, such as removing specific delivery destinations if a location is no longer accepting deliveries. To do this, users can click the "Edit" button next to each truck, select the destinations to remove, and the system will regenerate the manifest, maps, and loading strategy based on the updated route. This ensures flexibility in responding to last-minute changes.





In conclusion, this use case illustrates how advanced algorithms and Al-driven tools can revolutionize logistics operations by streamlining planning and enhance decision-making.

The key benefits include reduced transportation costs through optimal routing and loading, time savings from automated planning, improved delivery accuracy that boosts customer satisfaction, maximized truck capacity and resource allocation, and enhanced monitoring for continuous improvement.

By embracing this innovative approach, logistics companies can meet market demands and gain a competitive edge, paving the way for a smarter, more efficient future in the industry.

Get Started with mlangles

To book a free demo email us at



info.mlangles@cloudangles.com

Visit mlangles website



www.mlangles.ai