



Fine-tuning Llama VLM for Enhanced Product Descriptions

Distributed Training & Inference w/ Nebius Soperator

Agenda



01

Challenge: Improving Product Descriptions

02

Nebius Platform, Soperator & its benefits

03

Task 1: Distributed Training with Soperator

04

Task 2: Model Inference Deployment

05

Task 3: Model Comparison & Results

06

QnA & Next Steps

Challenge: Improving Product Descriptions

Mobile optimized



Scale & Resource Constraint Challenge

Creating appealing, enticing, and attractive descriptions for products manually is resource-intensive and doesn't scale. Limited copywriting resources

Conversion Rate Impact Challenge

Poor product descriptions directly hurt sales performance. 94% of shoppers will abandon the purchase or look for another site if they don't feel confident in their decision

Content Quality & Consistency Challenge

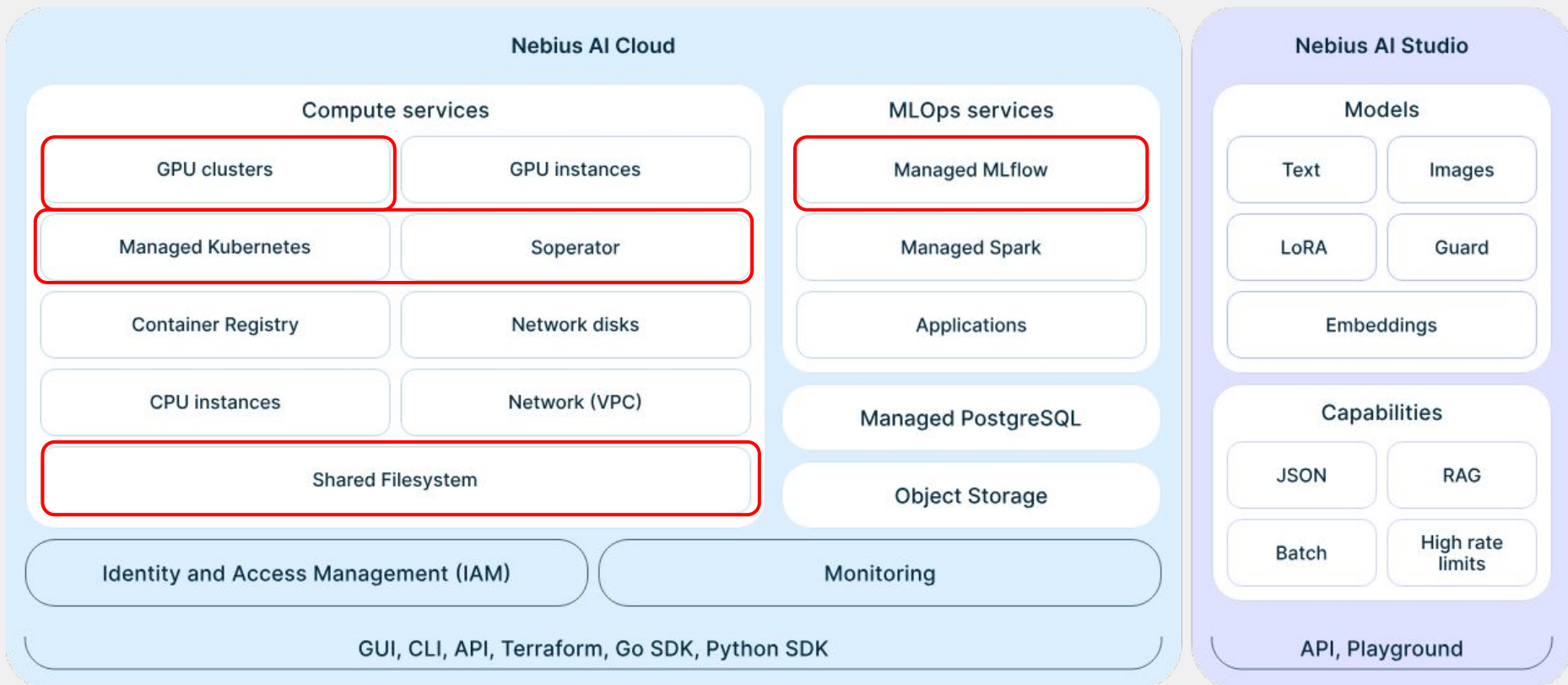
Maintaining consistent brand voice and quality across thousands of products is nearly impossible manually. Common copywriting mistakes skyrocket bounce rates and lower conversion rates

Poor Search Engine Optimization (SEO)

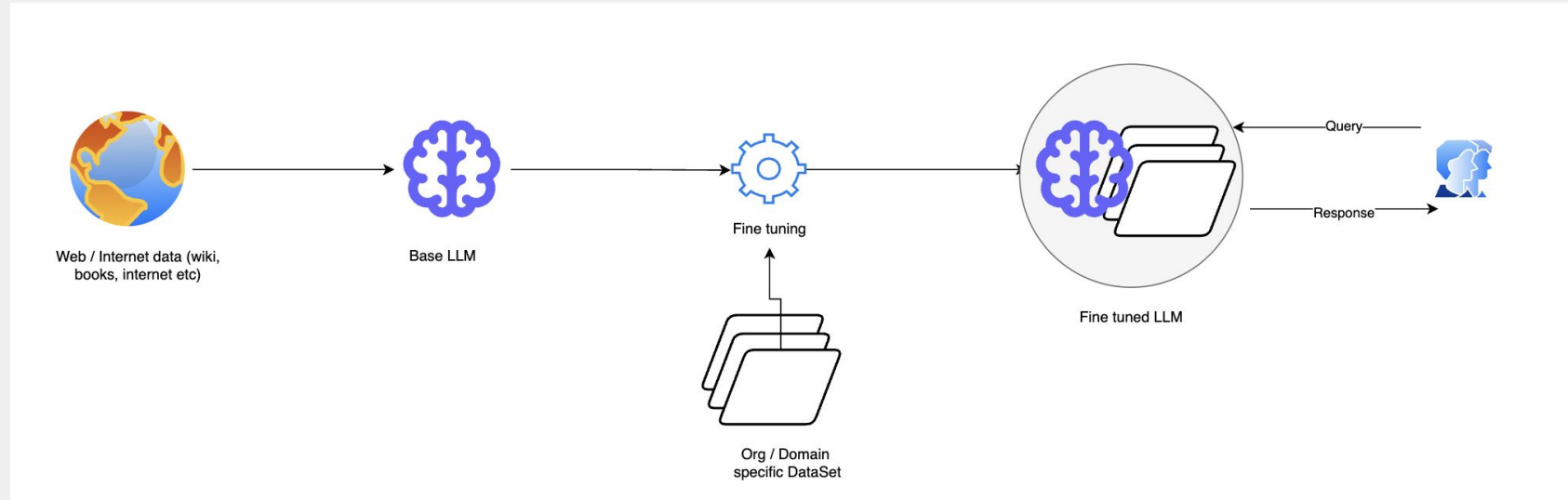
Descriptions that are not written with relevant keywords, making it difficult for potential customers to find the products through search engines

94% of shoppers will abandon a purchase if they don't feel confident, and descriptions are a key part of building that confidence.

AI Cloud + AI Studio for every AI need



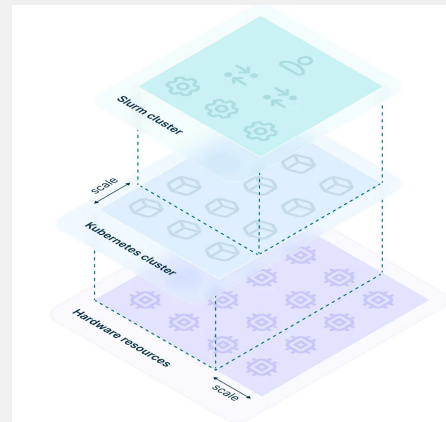
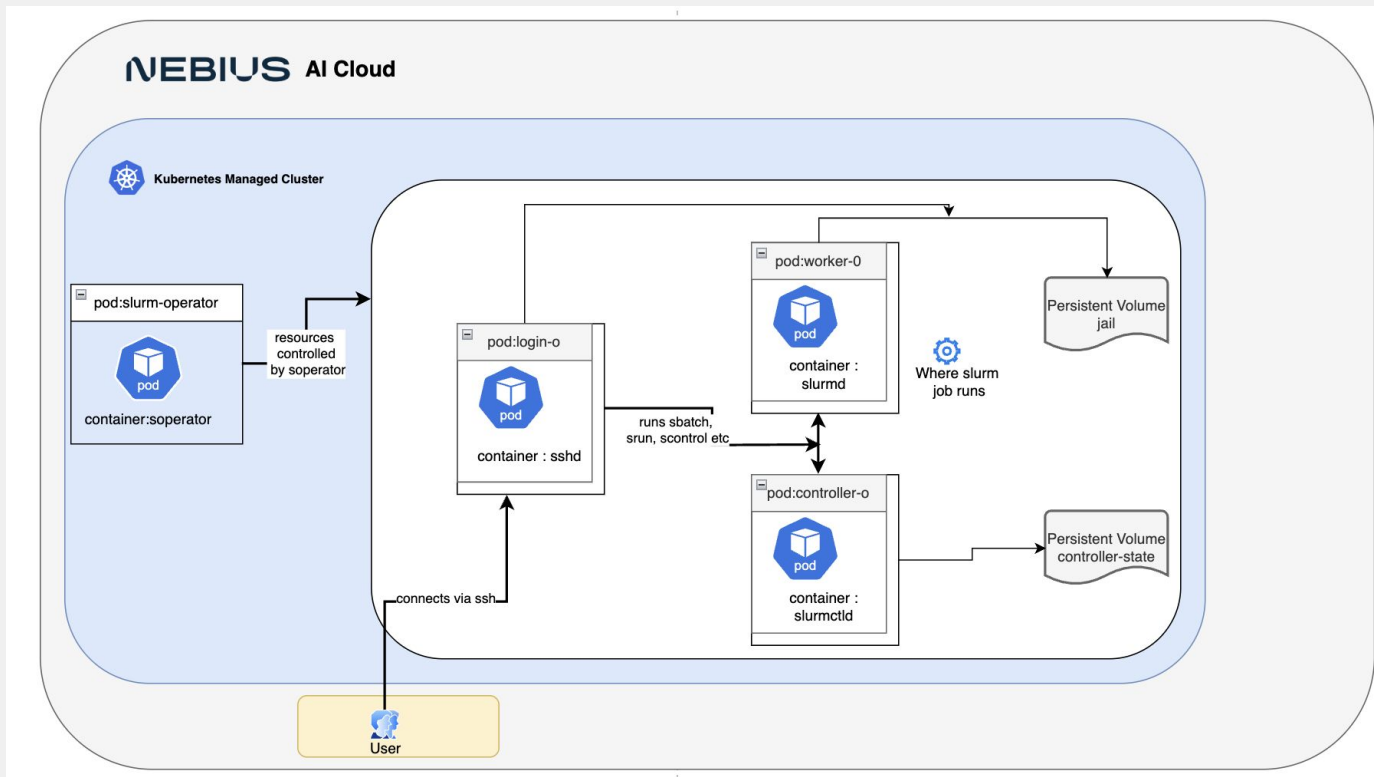
High Level LLM fine tuning Architecture



Key Requirements :

- Kubernetes based infrastructure
- Open Source LLM to avoid lock-in
- Scalability & Agility

Soperator Cluster Architecture (High Level)



Model Training Metrics

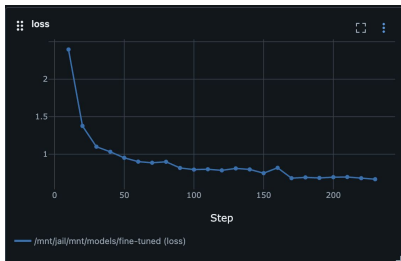
01

Training Loss

Initial Loss: ~2.5

Final Loss: ~0.6

Loss Reduction: 76% improvement ✓



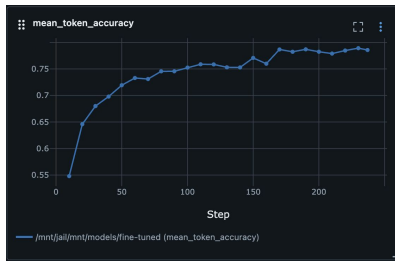
02

Accuracy

Initial Accuracy: ~55%

Final Accuracy: ~80%

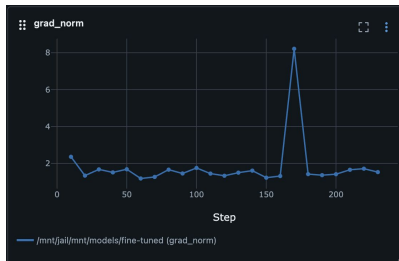
Accuracy Gain: 25 percentage points ✓



03

Gradient Spike

Training Stability: Good (except gradient spike) ⚠



Nebius Cloud + Soperator = Autoscaling and Self-healing of Kubernetes in Slurm

NEBIUS

Equipped with cutting-edge GPUs like NVIDIA L40s, H100, H200 for AI workloads

InfiniBand networking for ultra-fast data transfer, essential for training large models

Pre-configured Kubernetes environments optimized for machine learning pipelines

Massive GPU clusters capable of scaling to meet high-demand AI tasks



Soperator

Simplified cluster management: By having a shared root file system across all cluster nodes

Fault-tolerant training with GPU Health Checks

Enhanced scheduling and orchestration with easy scaling & high availability

Isolation of User Actions along with centralized logging system and observability

Benefits + Next Steps

Business Benefits

- Automated generation with consistent quality at scale. If a fine-tuned model improves conversion rates by even **0.5%, that's millions** in additional revenue for large retailers
- Vision-language models can understand products visually and generate culturally-appropriate descriptions
- One trained model can generate thousands of descriptions per hour. Data-driven optimization for higher conversion rates
- Consistent, brand-aligned descriptions with comprehensive coverage.
- New products can have high-quality descriptions instantly

Next Steps

- Train the model with ShopGlobe's brand guidelines on a multi-node distributed training.
- Experiment with different model architectures.
- Explore more advanced fine-tuning techniques.

Case Study (Reference only)

- 15-25% conversion rate increase
- 99.4% cost reduction per description
- 3x better search rankings
- 95% consistent quality

Thank you





Llama 3.2 VLM Model Comparison

Compare product descriptions generated by base and fine-tuned models

Input Image



Click to upload or drag & drop an image

Choose File



Product Name:

Action Figure

Category:

Toys & Games

Generate Descriptions

Retry Connection

Base Model: ● Online
Fine-tuned Model: ● Online

Base Model Generation

Base Model Response:

Introducing the ****Iron Man Action Figure****, a masterpiece crafted by Hot Toys, the renowned manufacturer of exquisite collectibles. This meticulously designed 1:6 scale action figure is a faithful recreation of the iconic superhero Iron Man from the Marvel Cinematic Universe. Standing at a height of approximately 30cm, it features a highly detailed and articulated body with over 30 points of articulation, allowing for dynamic posing. The figure is equipped with a light-up arc reactor in the chest, powered by two AAA batteries (not included), and comes with a sleek Iron Man Mark VII helmet, LED light-up arc reactor chip, and interchangeable hands for a wide range of gestures. The figure also includes a specially designed diorama base and a figure stand for stability and display. Immerse yourself in the world of Marvel with this incredible collectible, capturing the essence of Tony Stark's Iron Man suit in exquisite detail. Please note: Batteries not included. For display purposes only. Not intended for children under 14 years. Collectors aged 14 and above are recommended. ****Manufacturer:**** Hot Toys ****Product Dimensions:**** 30cm ****Item Weight:**** 200g ****Color:**** Red, Gold, Silver ****Package Dimensions:**** 19.4 x 8.9 x

Fine-tuned Model Generation

Fine-tuned Model Response:

Highly detailed and poseable action figure, perfect for collectors and kids alike! A must-have for any Marvel fan. Realistic design and durable construction ensure lasting fun. Add this collectible to your action figure collection today!



Llama 3.2 VLM Model Comparison

Compare product descriptions generated by base and fine-tuned models



Input Image



Click to upload or drag & drop an image

Choose File



Product Name:

Coffee Mug

Category:

Kitchen & Dining



Generate Descriptions



Retry Connection

Base Model: ● Online
Fine-tuned Model: ● Online



Base Model Generation

Base Model Response:

n
Embrace the Day with Coffee Cup Magic!\nIntroducing our delightful Coffee Mug, the perfect companion for your morning brew. Crafted with care, this charming mug brings a touch of warmth and joy to your daily coffee ritual. With a size of 400ml, it's the ideal cup to start your day with a smile.\nUnique Design:** Our Coffee Mug features a whimsical and vibrant design that's sure to brighten up your morning. The playful pattern adds a dash of personality to your coffee experience, making it a standout addition to your kitchenware collection.\n**Premium Material:** Made from high-quality ceramic, this mug is durable and designed to withstand your daily coffee adventures. Enjoy your favorite brew in comfort, knowing it's built to last.\n**Capacity:** 400ml of pure coffee bliss. The ideal size for a satisfying cup of joe or tea, allowing you to savor every moment.\n**Elevate Your Coffee Experience:** Whether you're a coffee connoisseur or simply appreciate the joy of a well-made cup, our Coffee Mug is designed to make your mornings better. It's not just a mug; it's a daily dose of happiness.\n** Sip, Smile, Repeat:** Start your day with



Fine-tuned Model Generation

Fine-tuned Model Response:

Upgrade your morning routine with our stylish and durable coffee mug! Perfect for sipping your favorite brew, this ceramic mug features a sleek design that adds a touch of sophistication to your kitchen. Easy to hold and dishwasher safe for hassle-free cleanup. Get yours today!