Geospatial AI at Scale

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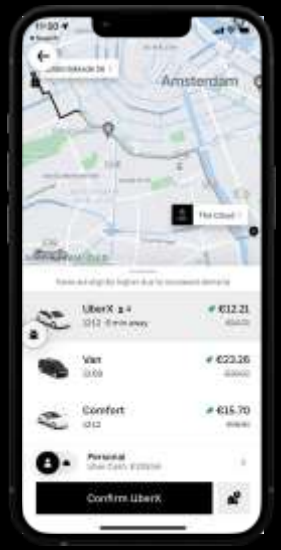
- **TPM / Data Scientist** | Uber AI, Maps, Operations
- **PhD** | Spatial Data Science
- **Consultant** | Monitor Deloitte, World Bank, UNDP
- **Co-founder** | Open Map Lebanon

Why do we need a map?

Search & Marketplace



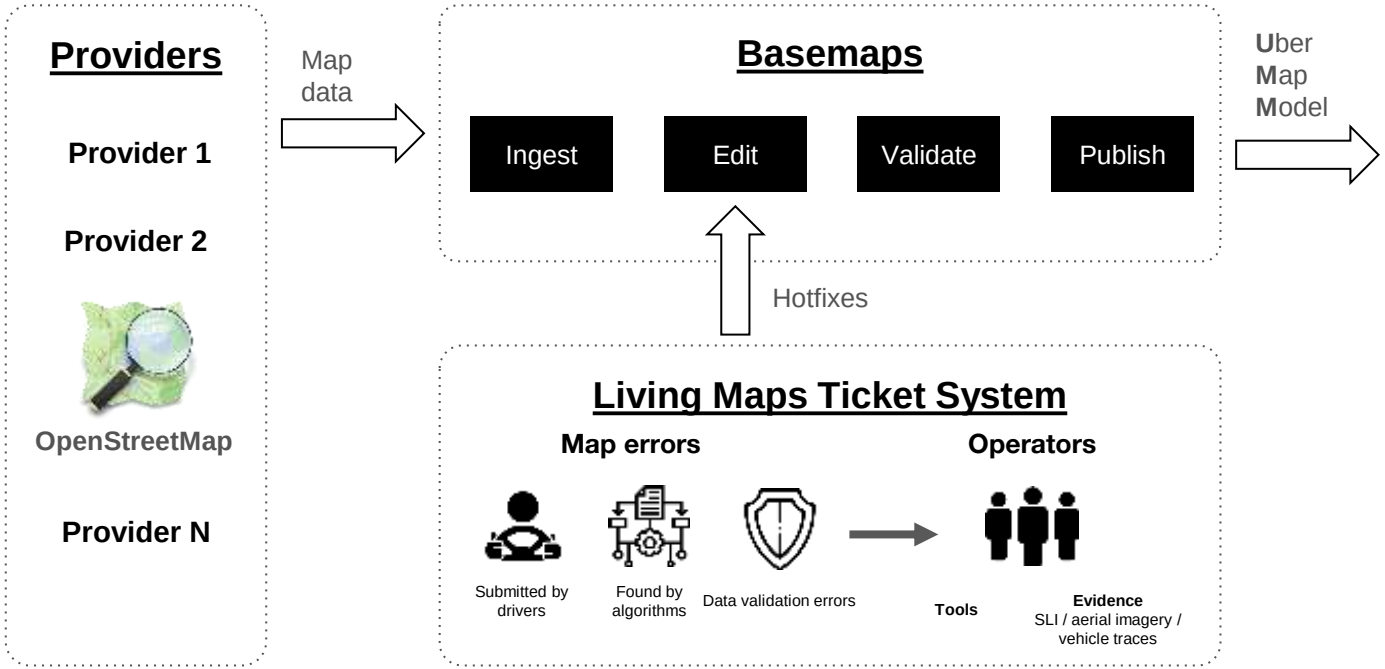
Order tracking

On-trip navigation

What data do we use?

		Layer	Services
Real-time		Traffic, events, weather Road closures	→ Turn-by-turn navigation → ETAs and routing
Places		POIs Addresses and parcels	→ Search → Geocoding
Basemaps		Road network Land use and water bodies Admin boundaries	→ Turn-by-turn navigation → ETAs and routing → Display Map tiles

How’s the map built?



Routing (and ETAs): How to get from point A to point B and how long it will take

Navigation: Visual and verbal turn-by-turn guidance for drivers

Display: The map that appears in the app, including navigation

Search: Find destinations, restaurants, points of interest, etc.

Uber Scale

70+

Countries

15,000+

Cities

Uber Scale

36M

Total Trips per Day

>15%

Year to Year Growth

Uber Scale

over 100,000 since I started talking!

Trips per second

600+

Combined Mobility and Delivery

Uber ML Scale

over 10,000,000,000
since I started talking!

45M++

Predictions per second

1M++

CPU&GPU cores

Michelangelo provides unique value for Uber's ML needs

Uber's business requires **large scale, low latency, and high quality** real-time ML

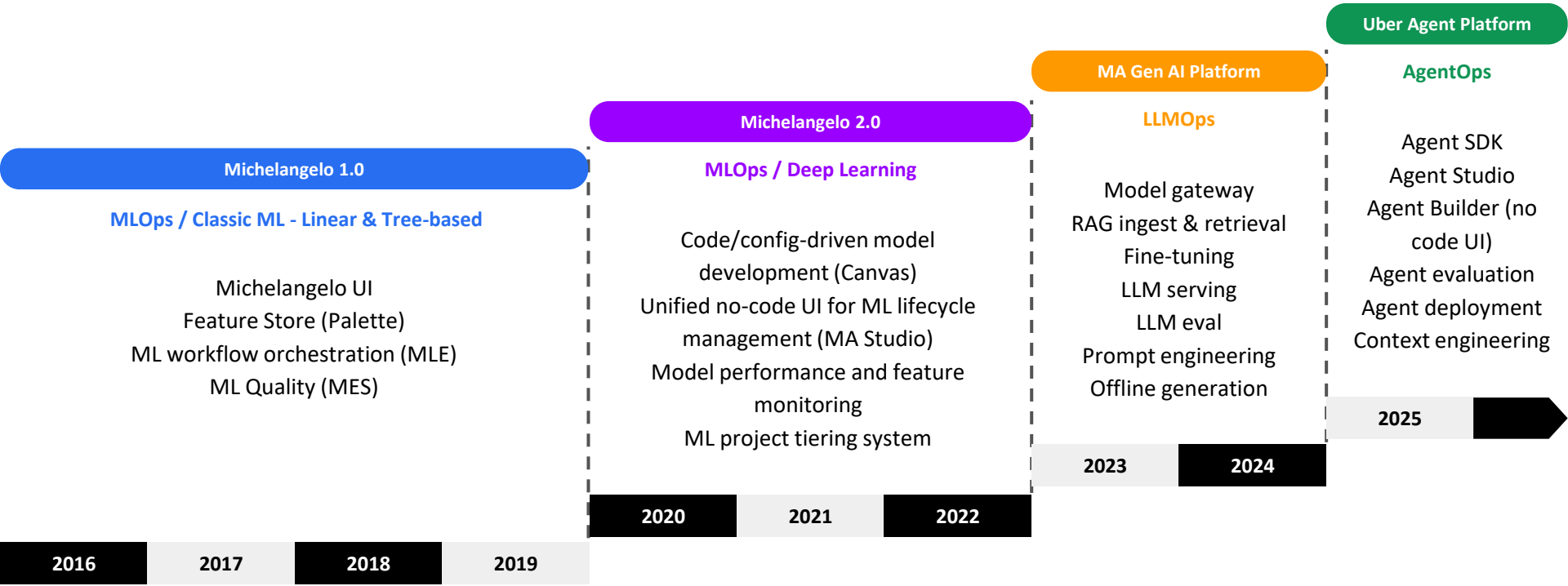
Prior to Michelangelo

- ✗ Ad-hoc pipelines and workflows
- ✗ Hard to productionize; impossible to scale
- ✗ Inconsistency, no code reuse, and duplicated effort across teams
- ✗ Monitoring was non-existent
- ✗ No governance or transparency of how ML was utilized at Uber

Michelangelo

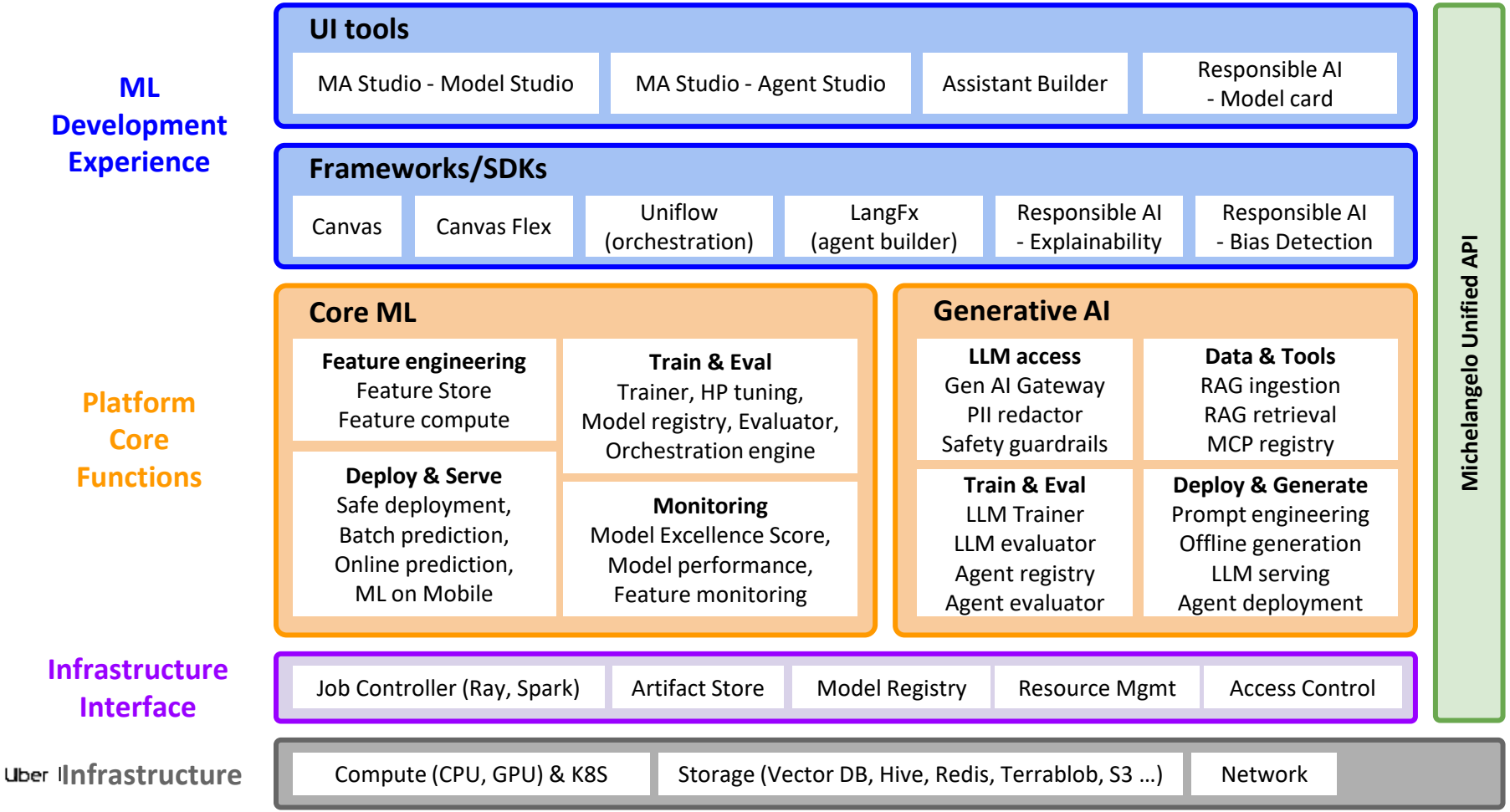
- ➔**A centralized ML platform** to manage the whole ML lifecycle to improve ML dev productivity
- ➔**ML best practices** are natively built-in and enforced via platform features to improve ML quality
- ➔**AI governance, regulation, and accountability** with end-to-end traceability and auditing
- ➔**Lead and drive company-wide ML initiatives**: e.g. DL adoption in 2021 and Gen AI adoption starting 2023

Evolution of Michelangelo - Uber's AI Platform

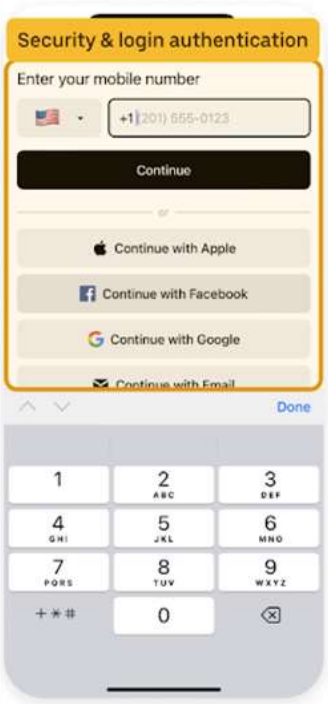


Uber

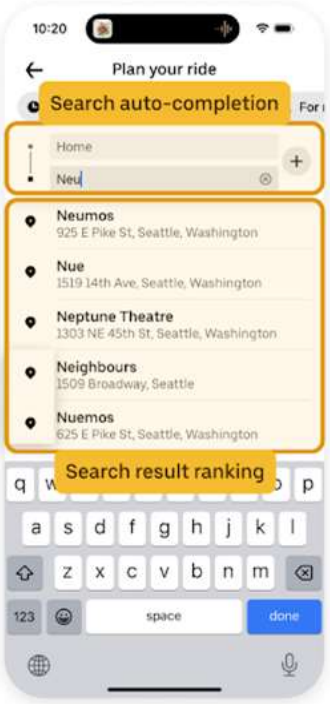
Michelangelo system overview



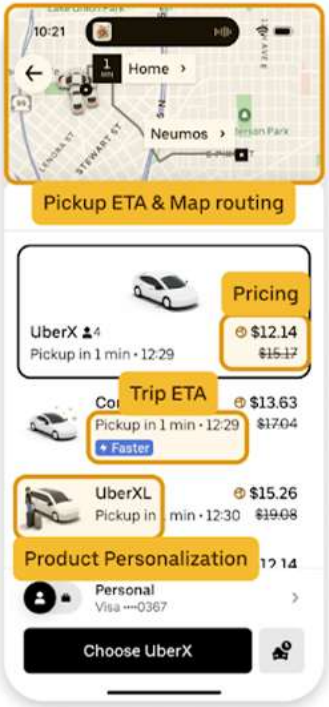
AI/ML powers Uber's magical user experience



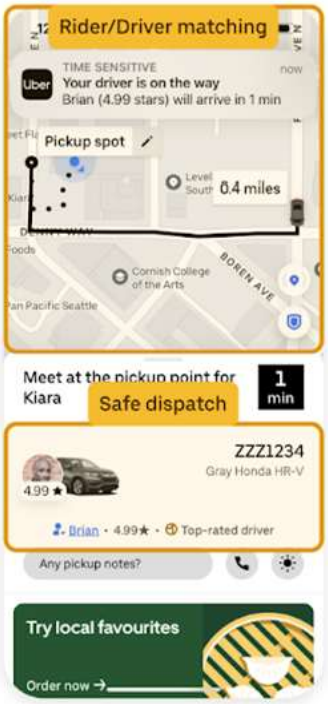
Login



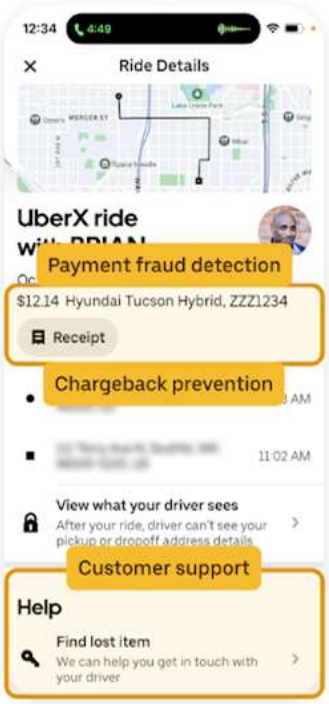
Search



Booking



Trip



Post-trip

Q&A