Dynamic Pricing in Ridepooling Services

Master's Thesis of Ahmet Akif Albayrak

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Ridepooling Demand ≠ Fix — Demand / Time
Peak: Unmet Demand
Dynamic Pricing Balances System — User Satisfaction / Operator Profit
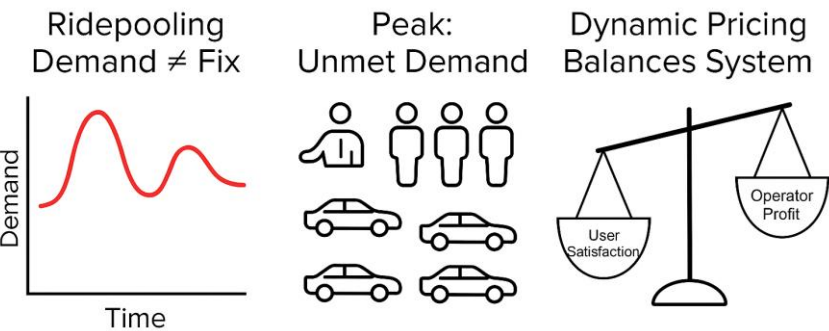
Methodology

Simulation Tool: FleetPy

Case Study: Manhattan

Pricing Strategies Tested:

- Flat Fare (Baseline)
- Multiplier Surge
- Additive Surge
- OD-Based Pricing
- Spatio-Temporal Pricing

Evaluation Metrics:

Profit, Service Rate, Fleet Utilization, Spatial Fairness

Modeling Highlights

Discrete Choice Mode: Probabilistic logit model

Public Transport integration using OpenTripPlanner

3 random seeds × 3 fleet sizes (60/80/100 vehicles)
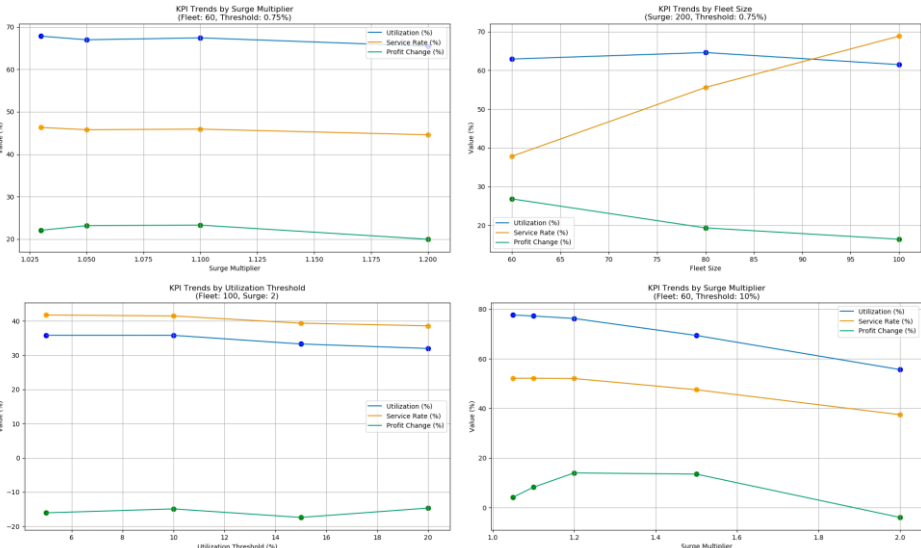
Background

Ridepooling enhances urban mobility but faces challenges in balancing demand, utilization, and equity.

Dynamic pricing offers a solution — but the effectiveness and trade-offs of different strategies are underexplored.

Research Questions

- How do dynamic pricing strategies affect demand, revenue, and utilization?

- What are the trade-offs between profit maximization and spatial fairness?

- Which pricing methods optimize efficiency and equity in ridepooling?
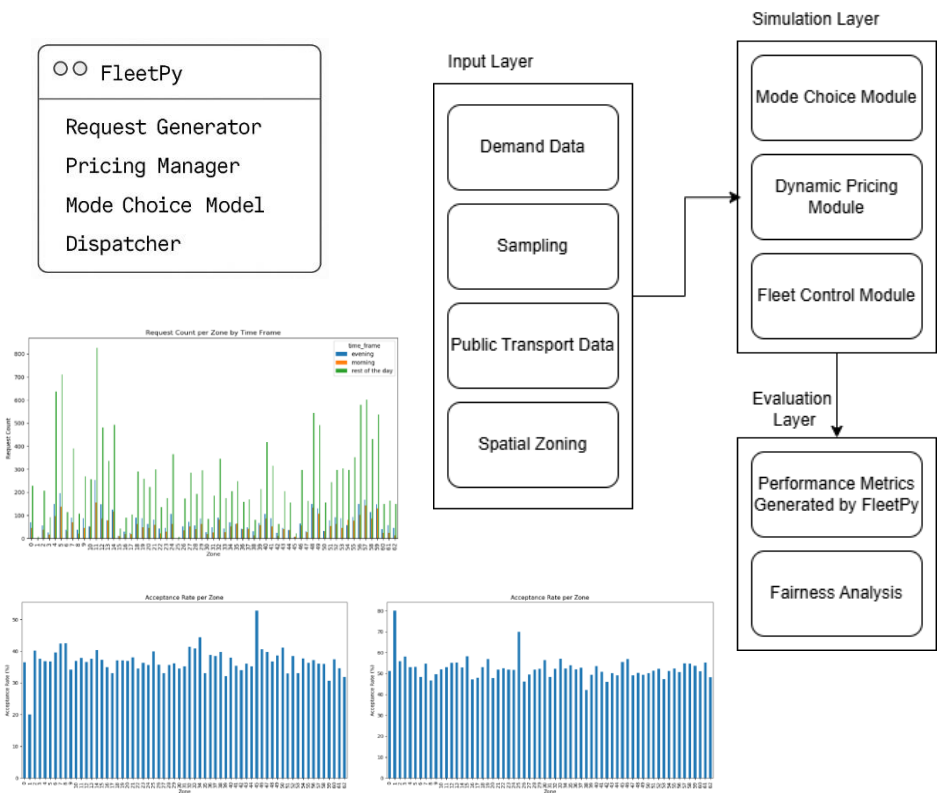
Key Results

Moderate surge strategies yield up to +30% profit with stable service rates

Aggressive pricing reduces fairness and demand

Spatio-temporal pricing offers best balance of equity and efficiency

Fairness varies greatly by strategy and configuration

Conclusion

Dynamic pricing can significantly improve ridepooling performance when carefully tuned. Equity considerations must be integrated into strategy design.

May 2025

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