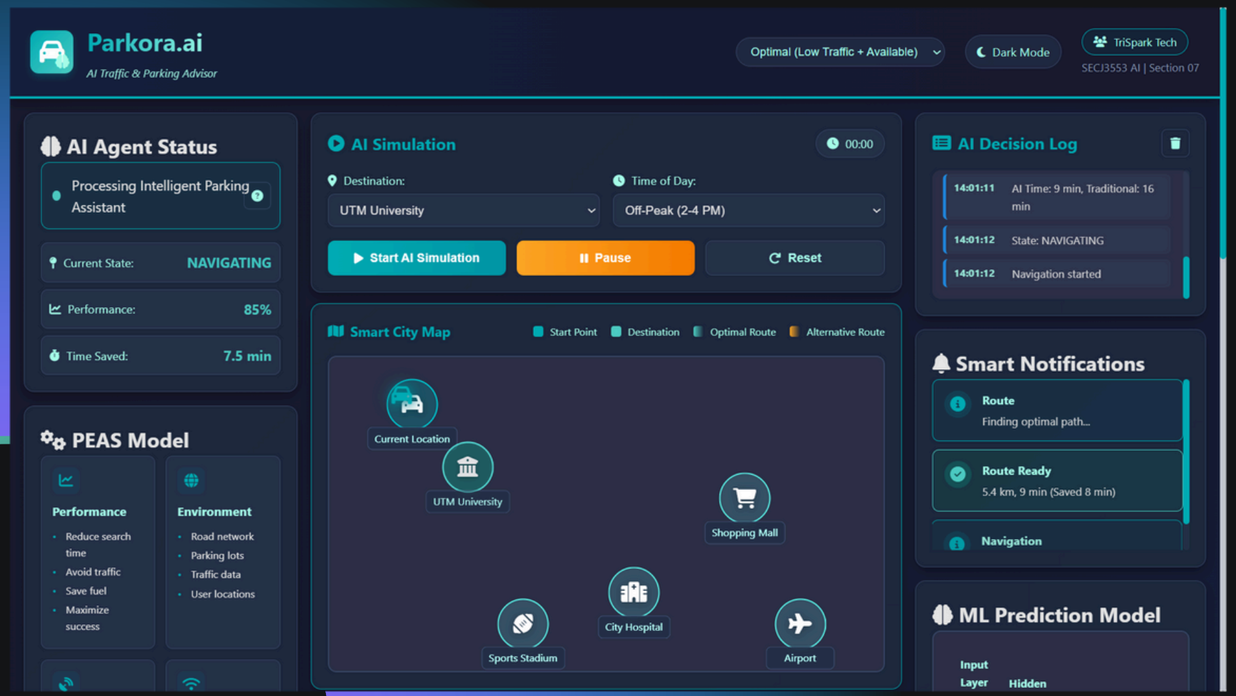
TRISPARK TECH

# Parkora.ai




SECJ3553 Artificial Intelligence
Section 07

TASK 5: PROTOTYPE DEVELOPMENT AND PROOF OF CONCEPT (POC)

Project Theme:
Smart City - Traffic & Parking Advisor Application (Parkora.ai)

# Our Team

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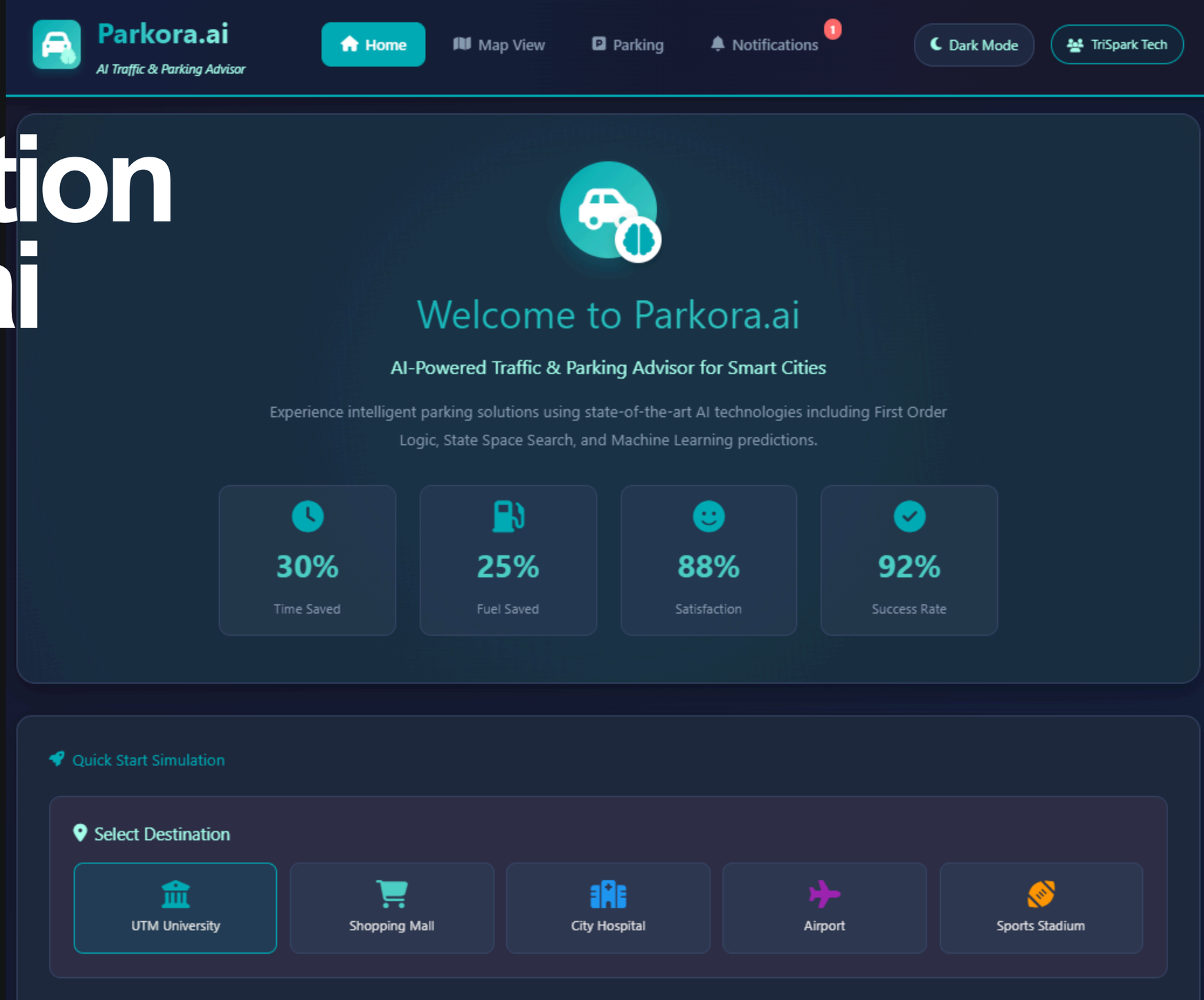
# The Problem

- Research shows up to 30% of urban traffic
- Drivers search for parking
- Wastes fuel, increase pollution, stresses everyone out

# Our Solution Parkora.ai

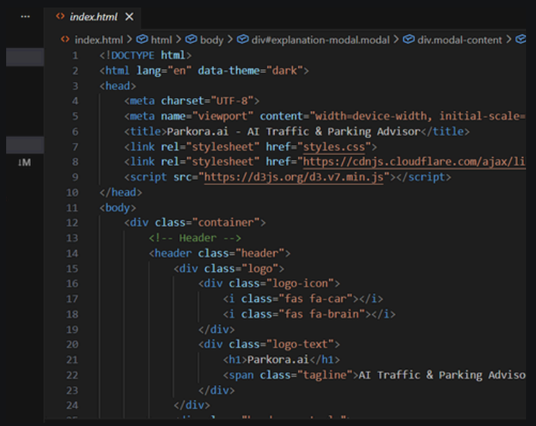
Intelligent parking advisor that uses artificial intelligence to guide drivers to available parking in real-time.



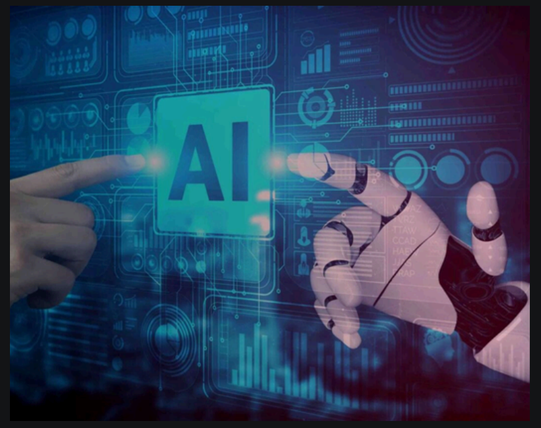
# Strategic Vision & POC Approach

Figma

1. Design the experience with Figma prototypes to ensure it's user-friendly

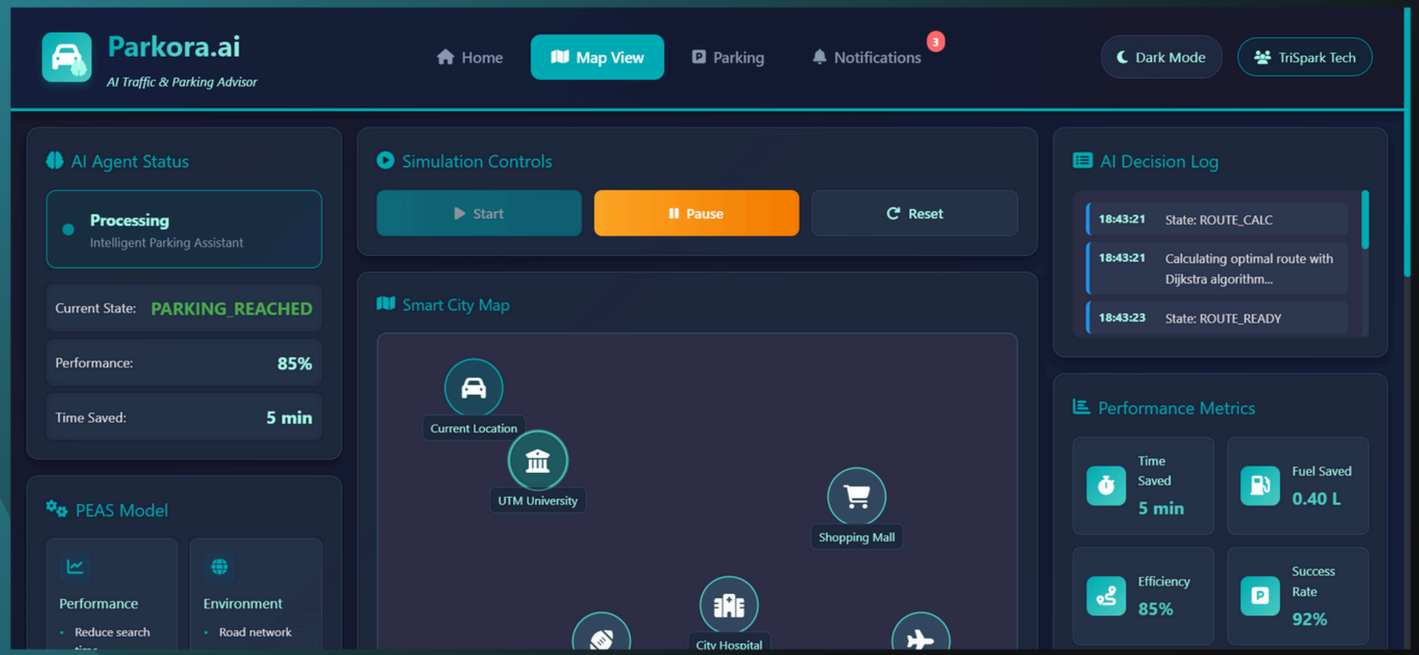



2. Build a fully functional web-based POC that simulates a smart city environment




3. AI implementation






# FIGMA

- Map out the complete user journey
- Design intuitive interfaces for homepage, map views, and notifications
- Validate our user flow before development
- Collaborate effectively as a team"

# Working Prototype - Live Demo

- Frontend: HTML5, CSS3, JavaScript – platform-independent, zero-dependency deployment
- Visualisation: D3.js – enables interactive state space and algorithm animations
- Algorithms: Dijkstra/A* – classical search algorithms implemented in pure JavaScript
- Simulation: Mock data system – models urban dynamics without external API dependencies

# Functional Validation

**Real-Time Adaptation Verified**

- Our system adapts to different urban conditions.
- When we switch to “Severe Delay”, the AI immediately recalculates, showing real-time decision making.

**Personalized Decisions**

- User can select destination and time of day. User’s preferences change the result of the AI calculation.

**Quantifiable, Real-time Metrics**

- Every simulation generates live metrics, such as time reduction and fuel savings which are from actual route algorithms.


# Technical Verification

## FOL Knowledge Representation

- From AI Decision Explanation, it transforms 5 FOL rules into working logic.

$\forall p\ (ParkingLot(p) \rightarrow (Available(p) \leftrightarrow \exists s\ (Space(s) \wedge In(s, p) \wedge \neg Occupied(s))))$
$\forall r\ \forall p\ ((Route(r) \wedge Connects(r, UserLocation, p) \wedge Available(p) \wedge LeastCost(r)) \rightarrow OptimalRoute(r))$
$\forall p\ \forall t\ ((ParkingLot(p) \wedge HighOccupancy(p, time\_past)) \rightarrow LikelyUnavailable(p, time\_now))$
$\forall p\ ((Available(p) \wedge Near(p, Destination)) \rightarrow Preferred(p))$
$\forall p\ ((Available(p) \wedge Near(p, Destination)) \rightarrow Preferred(p))$

## State Space Search Visualization

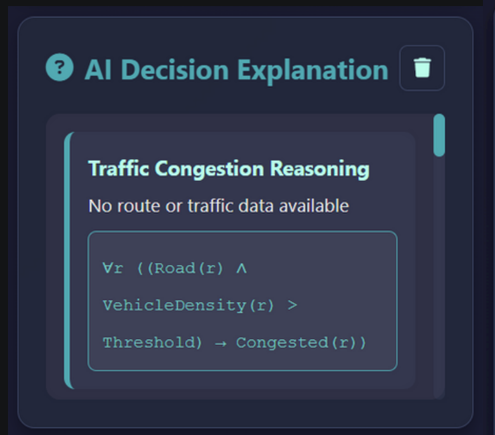
- Each node represents an actual state in our system.
- Real-time transition tracking is visualize.

## Dijkstra's Algorithm Live Demo

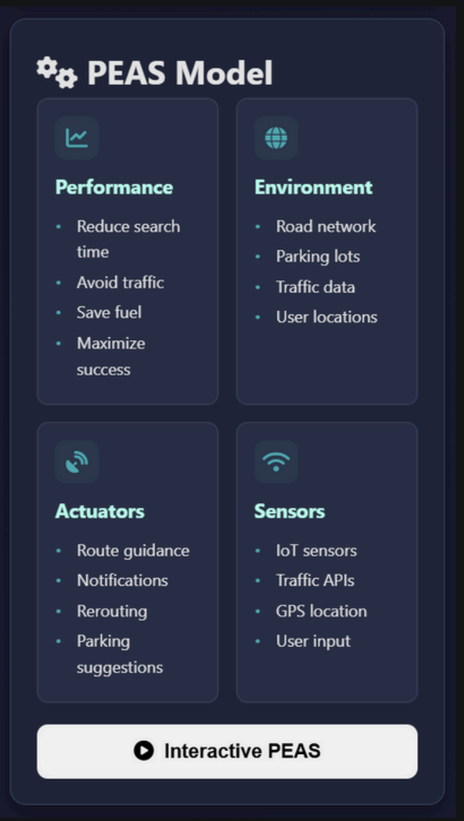
- Green nodes are visited, yellow are in the frontier and the path shows in real-time.

## Complete PEAS Model

- Every component is implemented. Performance measures update live; Environment conditions change with scenarios; Actuators triggers notifications and Sensors simulate real-world data.







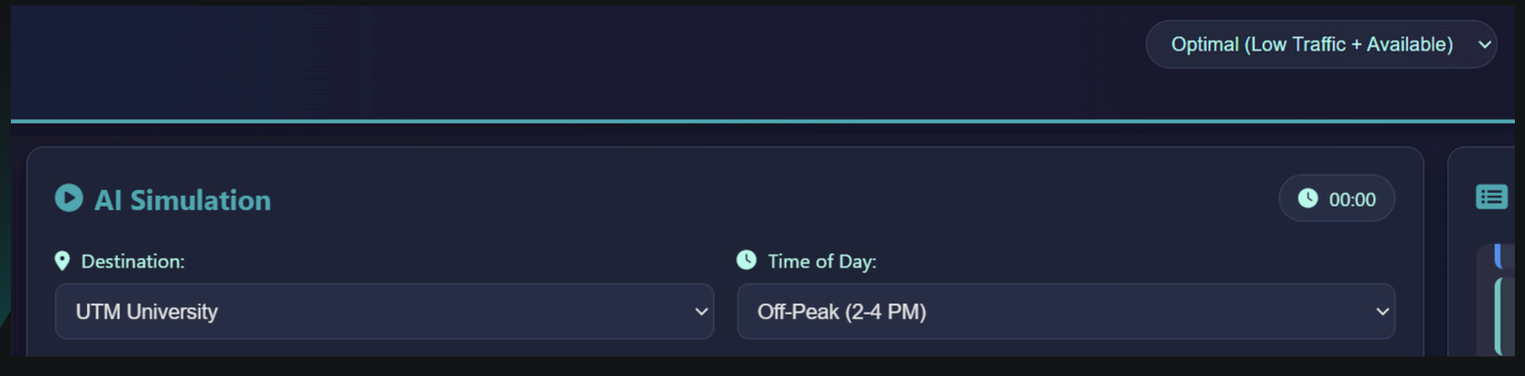
# Quantifiable Impact

In optimal situation,

- Time saved: 7.5 min per parking search
- Fuel saved: 0.60L
- Success Rate: 100% on the first attempt to find an available spot.

The traditional success rate (53%) is lower compared to AI-assisted success rate (100%).

This data validates our core value proposition: Parkora.ai reduces urban friction, saves drivers time and money and contributes to lower emissions by cutting down unnecessary traffic.




## Performance Metrics

| Time Saved | Fuel Saved |
|---|---|
| 7.5 min | 0.60 L |

| Efficiency | Success Rate |
|---|---|
| 100% | 100% |

**Traditional vs AI Performance**

| Traditional | AI-Assisted |
|---|---|
| 53% | 100% |

## Concept Verification

| | |
|---|---|
| Time Reduction: | 47% |
| Fuel Savings: | 6% |
| User Satisfaction: | 95% |
| Success Rate: | 100% |

# Practical Relevance and Future Vision

**Scalable Architecture**
Our system is designed for integration. The PEAS model shows exactly where IoT sensors and traffic APIs would connect.

**Smart City Ready**
It’s a functional interface which can change the destination, simulating how real users would interact.

**Educational Value Proved**
We have successfully transformed concepts from FOL to state space search which is a working system that solves actual urban problems.

# Summary

1. **Problem Solved:**
   Urban parking inefficiency.
2. **Solution Built:**
   AI-powered parking advisor
3. **Technology Used:**
   FOL, State Space Search, PEAS, ML
4. **Impact Measured:**
   Measurable improvements proven through testing

# Thank You


QNA SESSION