FindMySpot: AI-Powered Smart Car Parking Spot Finder for the UAE

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1. Problem Statement (with ESG Focus)

Finding parking in **shopping malls, entertainment areas, and university campuses** across the **UAE**, such as **Yas Mall** and **Zayed University**, is time-consuming and frustrating, leading to:

- **Environmental Issues (E):** Increased CO_2 emissions due to unnecessary idling and circling.
- **Social Issues (S):** Driver frustration, reduced customer satisfaction, and inefficient urban mobility.
- **Governance Challenges (G):** Poor parking management, inefficient resource allocation, and traffic congestion.

Current parking apps only show general parking zones, not real-time spot-specific availability, causing drivers to waste time and fuel.

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2. Proposed Solution: AI-Powered Smart Parking System

An advanced mobile application integrated with **Nokia's cutting-edge technologies (5G, IoT, AI Edge Computing)** that:

- Guides drivers directly to the **nearest available parking spot** in real-time.
- Reduces environmental impact and improves traffic flow.
- Enhances the overall parking experience for UAE residents, tourists, and university students.

Key Features:

- **Real-Time Parking Spot Detection:**
    - **IoT-enabled smart sensors** in parking lots detect spot availability.
    - **Nokia's AI algorithms** analyze sensor data and predict future spot availability based on traffic patterns.
- **Dynamic Navigation Guidance:**
    - The **FindMySpot app** provides turn-by-turn navigation to the exact available spot.

    - **AI-driven suggestions** for nearby parking if the desired area is full.
- **Smart Reservation & Auto-Payment System:**
    - Drivers can **reserve parking spots** in advance during peak hours.
    - Integrated **auto-payment system** for public and private paid parking.
- **University-Specific Features:**
    - **Priority parking spots** for faculty and staff.
    - **Real-time availability** updates for student and visitor parking zones.
    - **Event-based parking management** for university events and conferences.

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3. Real-World Example: Yas Mall & Zayed University

At **Yas Mall** and **Zayed University**, finding parking during weekends, events, or peak academic hours is challenging:

- **Current Scenario:** Drivers waste 10–20 minutes circling for a spot, causing congestion and frustration.
- **With FindMySpot:**
    - Drivers open the **FindMySpot app** to see **real-time available spots**.
    - **AI-powered navigation** guides them directly to the spot—no need to guess or roam around.
    - The **reservation feature** allows booking spots in advance for events and university functions.

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4. Nokia Technology Integration

- **5G-Powered Real-Time Data Transmission:**
    - Nokia's **5G network** ensures low-latency, real-time updates for spot availability.
- **IoT Sensor Connectivity:**
    - **Nokia IoT technology** connects smart ground sensors with the app, providing accurate, real-time data.
- **AI Edge Computing:**
    - **Nokia Edge AI** processes parking data locally, enabling faster predictions without relying heavily on cloud processing.

- **In-Car Dashboard & Smart Device Integration:**
    - The **FindMySpot app** can integrate with **Nokia-powered car dashboards** for seamless in-vehicle navigation.
    - **Nokia smartwatches** can send quick parking availability notifications.

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5. Feasibility of the Project

- **Technical Feasibility:**
    - Leverages existing **parking infrastructure and smart city systems** across the UAE.
    - Easy integration with Nokia's IoT, 5G, and AI platforms.
- **Operational Feasibility:**
    - Scalable across malls, entertainment venues, and university campuses without major infrastructure changes.
    - User-friendly app design with a minimal learning curve.
- **Financial Feasibility:**
    - **Cost-effective** implementation using existing sensor networks.
    - Potential revenue through partnerships with malls, universities, and event organizers for premium parking reservations.

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6. ESG Impact

- **Environmental (E):**
    - Reduces CO_2 emissions by minimizing idle time and unnecessary driving.
    - Supports the UAE's sustainability goals under smart city initiatives.
- **Social (S):**
    - Enhances the customer experience in malls, entertainment areas, and university campuses.
    - Reduces stress, improves time management, and promotes smarter urban living.
- **Governance (G):**
    - Provides data-driven insights to city planners, mall operators, and university administrators for better parking and traffic management.

- Aligns with the UAE's smart governance and digital transformation goals.

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7. User Journey Map

1. **Search for Parking:**
   - User opens the **FindMySpot app** or receives an automatic parking suggestion via a Nokia device.
2. **Real-Time Spot Availability:**
   - The app shows nearby real-time available spots.
3. **Guided Navigation:**
   - AI-powered turn-by-turn navigation guides the driver directly to the spot.
4. **Reservation (Optional):**
   - The user can reserve a spot if heading to a busy area, mall, or university event.
5. **Auto-Payment & Exit:**
   - The app automatically handles payment based on parking duration.

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8. AI Model Architecture

- **Input Data:**
  - IoT sensors, CCTV footage, historical parking data, traffic patterns, and university event schedules.
- **Processing:**
  - Edge AI for real-time analysis.
  - Predictive algorithms to forecast spot availability.
- **Output:**
  - Real-time spot recommendations.
  - Navigation routes.
  - Reservation and payment automation.