

Success Story

Unthinkable develops an AI-powered license plate recognition app for efficient parking lot management

Customer

A Leading Parking Lot Management Company

Country

United States





Industry

Travel & Transportation

About The Client

The client is one of the largest parking lot management companies that operate in more than 150 cities across the United States. It provides its parking facilities to aviation, commercial, healthcare, hospitality, and government clients in over 15,000+ parking lots.

Technology Stack

 python™	 TensorFlow
 Swift	 OpenCV

Business Situation

With a steady growth of new accounts in different cities of the United States, the client intended to back itself with technology-centric solutions to optimize its cost and operations. The client was seeking a technology solution that could help them to streamline security & surveillance, manage access controls & permits, etc. However, the hardware devices used in parking lots for visual surveillance and automatic license plate recognition are usually expensive and prone to errors. To curb the dependency on sophisticated hardware devices, the client intended to develop an iOS mobile app that could automatically detect the license plate on the vehicle (s), analyze the number, and send the information directly to the system.

The client was in search of a technology partner who could help them transform their vision into a market fit product. The selection criteria included intensive experience in developing mobile applications as well as creating visually appealing UI/UX with focus on user behavior. The client chose Unthinkable Solutions as we brought on the table our years of experience in mobile app development, as well as subject matter experts of online user behavior. On the development front, the requirement was to:

- ✔ Conceptualize, design and develop a smart mobile based parking management system that could automatically detect the license plate on the vehicle (s), analyze the number, and calculate time patterns and send the information directly to the system.
- ✔ Incorporate Artificial intelligence-based techniques that could analyze data such as vehicular traffic, vehicle type, peak hour timings, and frequency to predict future trends and provide a seamless parking experience over time.
- ✔ Integrate digital payment methods so that the app could assist in saving time for the visitor and help the parking operator run the parking lot way more efficiently

The Solution

The project began with our business analytics and software architects outlining the optimal architecture of the parking management system. They refined the functional requirements and developed a complete product vision and its development roadmap. Once the strategic plans were mutually finalized, Unthinkable's team mapped the requirements onto the technology landscape and suggested Artificial Intelligence, Computer Vision, Google OCR and Python as the core technologies for app development.

To achieve this with maximum accuracy, team Unthinkable utilized the applications of Artificial Intelligence such as Machine Learning and Computer Vision. The AI experts at Unthinkable developed machine learning models (MobileNet V2) for object recognition on mobile devices. The models were trained on a dataset of 10,000 images of vehicles in varied lighting conditions (day, night), distance, weather. Some of the major challenges in achieving accuracy in results were the movement of vehicles, a varying pattern of license plates, and the number of vehicles captured in one frame.

The mobile app calculates the confidence score of images captured in every frame. If the confidence score is above 50%, the image frame is considered to be a license plate, while the rest of the frames are discarded. This ensured that the recognized plate by the app is a meaningful object and is not junk data. Once a license plate is detected, the Google OCR pre-trained model crops the text area to read the text on the plate.

The Impact

For recognizing the license plate at a distance, the app is built with a zoom slider which can be managed between 1x-8x according to the distance of the vehicle from the mobile device. With all these measures taken, the app was able to recognize multiple vehicles moving at a speed of 50-60 miles per hour.

The client was able to implement the solution in a timely and desired manner as Unthinkable ensured that the deliverables were provided on time, while maintaining utmost quality. Within a few months of its launch, the solution has been implemented in 1000+ car parkings across the US. The client has been extremely satisfied by the way Unthinkable has executed their vision and have planned for further updates to the system. More than 80,000 vehicles have been analyzed through the application with 99.98% accuracy

Is there a digital platform you want to build or take to the next level?

Setup a personalized consultation with our technology expert.

Let's Talk