

# CrowdAI: Improving Umrah

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# CrowdAI Overview

## AI Powered Pilgrim Counter

### Benefits for Police & Officials

Dashboard  
with Easy View  
of Crowds

Existing  
Camera  
Integration

Virtual  
Overhead View  
of All Areas

TVs Direct Pilgrims  
to Less Crowded  
Areas, Closing off  
area if Needed

### Benefits to Pilgrims

App to Show Crowds  
in Areas & Better  
Times to Come Back

Bathroom Wait  
Time

No Cell Plans  
Needed to Use  
App

Easy Navigation  
to Anywhere

Location &  
Language Specific  
Announcements

Free Short  
Texting

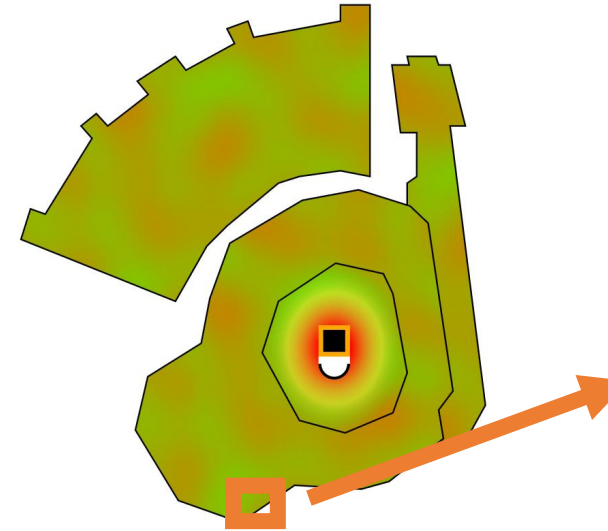
# CrowdAI Uses Machine Learning to Count Crowds With Existing Cameras



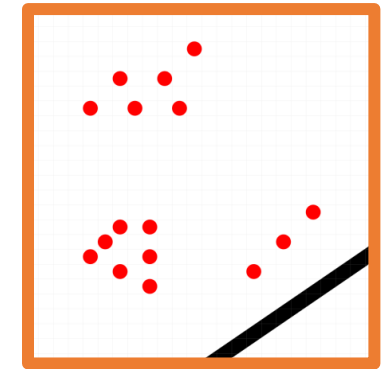
What Existing Cameras See



Subsection of What AI Sees



What AI Creates



Can Zoom in to See Individual People

- Through machine learning, existing security/TV cameras can be used to count number of people in **real time**, always giving a **quick & accurate** view
- Further AI training will allow for **even low-quality camera** footage to be used

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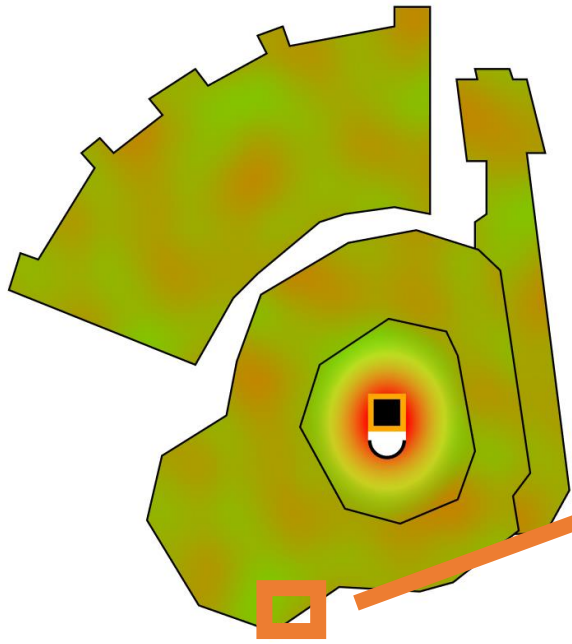
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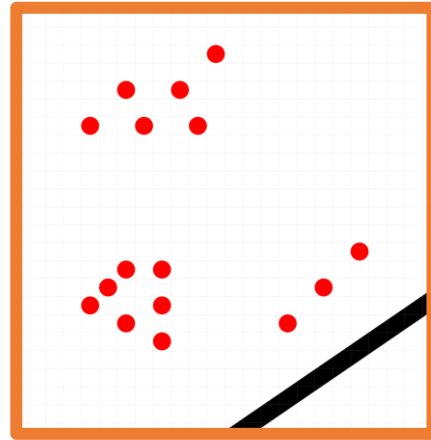
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# CrowdAI Provides For An Easy Dashboard to View Crowds



Crowd Management Dashboard  
for Masjid Al Haram



Can Zoom in to See Individual  
People



Satellite Overhead View, Much  
Higher Quality is Possible

- A simple dashboard, also accessible on guard phones, allows for an **easy view of all crowds**.
- With enough cameras, linear transforms can provide a high quality **virtual overhead view**, like it would be viewed from the air.

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# CrowdAI Uses Automated TVs to Direct Crowds



- TVs can display information about crowds to **automatically balance people**, redirect people when **crowdedness is dangerous**, and show **wait times** for key areas.

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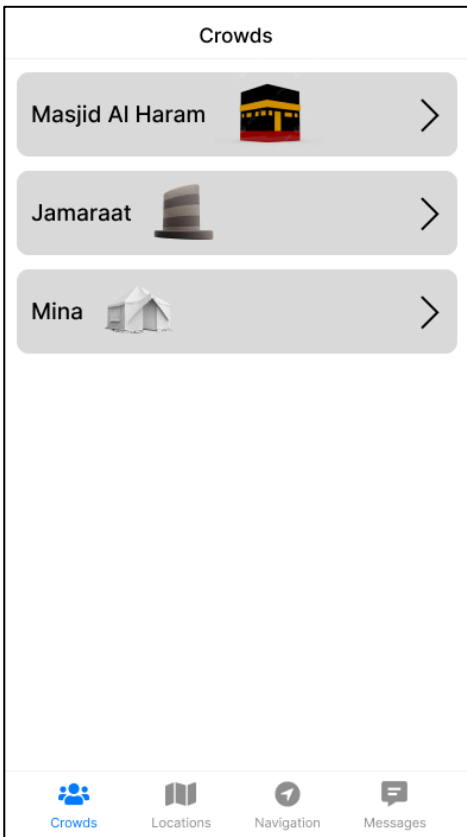
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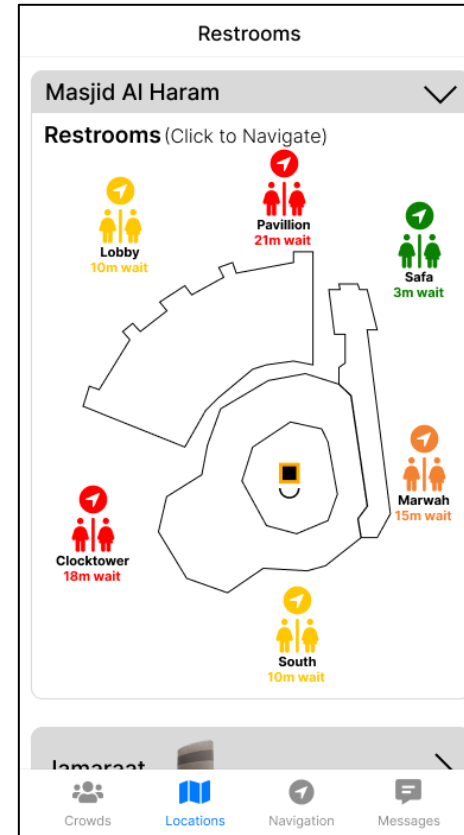
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# App for Pilgrims Shows How Crowded Places Are and Allows For Better Planning



- Pilgrims can see how crowded certain areas are
- Can see when areas will be **less crowded**.



- Pilgrims can also see **approximate wait time** at bathrooms and other busy places
- Note that for bathrooms, distance sensors, *not* cameras, will be used to count people

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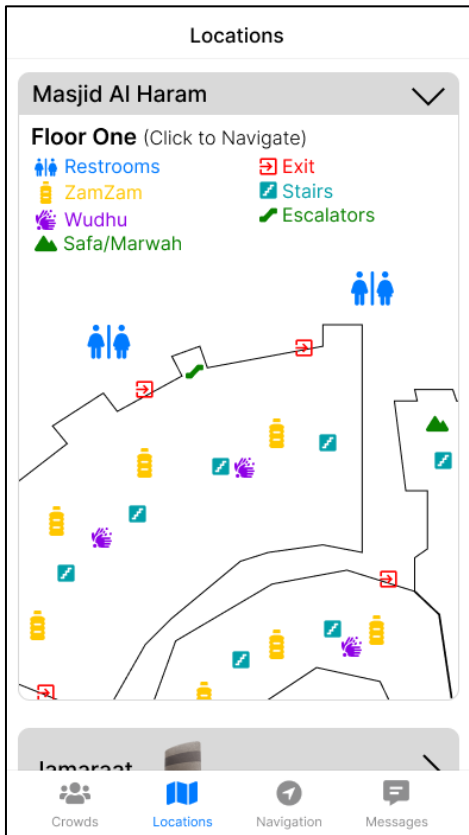
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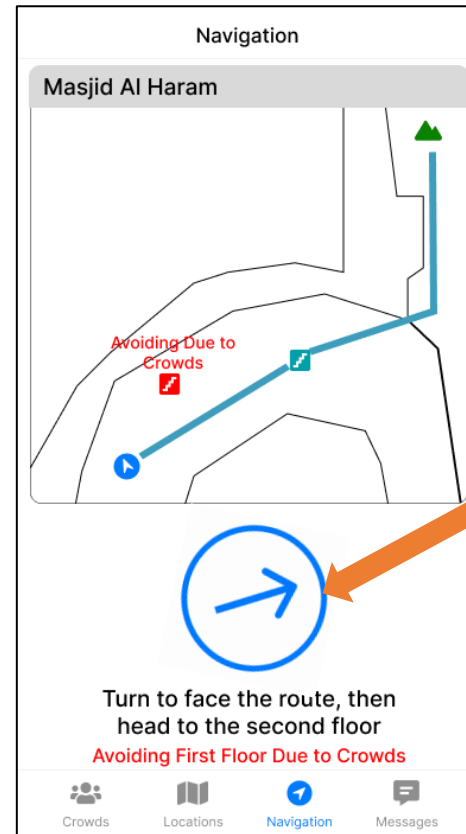
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# App for Pilgrims Allows for Easy Navigation



- Pilgrims can see **location of anything** on the map
- Can mark where you entered a complex to remember
- Can filter to only certain things



- Bluetooth LE Beacons provide **highly accurate directions**
- Just **follow the arrow** like you would a compass, no need to read signs
- Automatic **crowd management** by routing people away from crowded areas

- When a pilgrim selects a route, the AI will also suggest different times to go when it will be **less crowded**
- The AI can also suggest the **optimal route** for Tawaaf & Sa'ee

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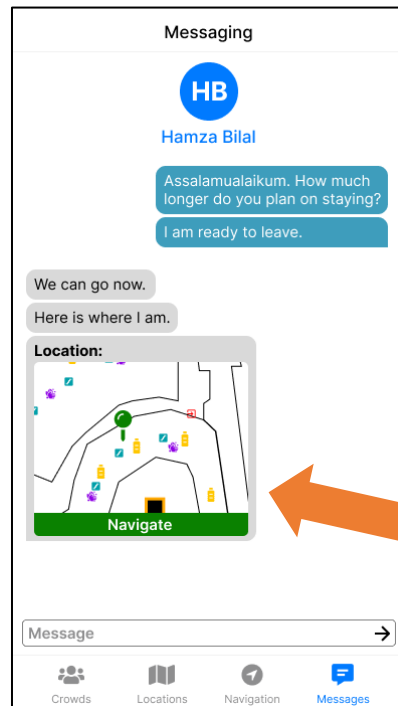
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# Navigation Beacons Allow For App to be Used With No Cell Plan

- All data on app can be transmitted through the navigation beacons, so **no cell plan or WiFi** is needed to use the app
- Dedicated navigation beacons ensures that signal saturation **never** affects critical systems
- Beacons are **low cost** and **need no wiring**



- Navigation beacons can also let people send **short text messages** to each other for free
- Helps with coordination
- Can include **location with navigation directions**

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# App for Pilgrims Allows for Many Languages and Local Announcements

- Navigation beacons can be used for local announcements to **people only in specific areas** in many languages
- Can be very helpful in coordinating people and **emergencies**.
- Can tell people to **stay away** from areas. Previously mentioned TVs and app will **show area as closed off**.



- App also supports many languages with easy selections screen

# App Contains Many Commercial Prospects



- At sporting events, lines for food and bathrooms are often very long and app can show people where it is shortest



- Theme parks can be very crowded and app can allow management to start events at different parts of park to reduce crowds
- Can also show wait times for rides, restaurants, and experiences