GRAYMATICS

Case study document

GRAYMATICS'
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- **Building Management – Indoors/ campus**
    - Access Management using Facial Recognition;
    - Attendance Management using FR;
    - Abandoned objects in lobby and corridors;
    - Fire hazard alerts;
    - Automobiles lingering in the lobby pick-up area;
    - Detecting smoking people in non-smoking zones
    - Loitering and intrusion detections
    - ANPR
    - Vehicle counting and vehicle color
    - Vehicle Over-speeding
    - Spillage
    - Debris/Garbage bags lying around the corridors and Parking areas
    - Vehicles in No parking zone
    - Identify More than 25 people on a particular spot (Some issue due to which we have a Crowd)
    - Birds and Animal movement on premise
    - Vehicle navigation
    - Water leakages
    - Identifying Staff on each floor
    - People movement
    - Child Safety on Amenities floor
    - Man on floor (health issue)
    - Rowdy Crowd scenarios
    - Health of Plants and Grass
    - Identifying suspicious persons / scenarios
    - Type of Vehicle segregated into,
        i. 4 wheeler/2 wheeler
        ii. Taxi/ Private Vehicle

2. **Car Parking Lots**
    - Wrong Direction movement of Automobile
    - Available parking slots
    - Vehicle type and ANPR detection to identify wrong parking
    - Vehicle ANPR detection for boom-barrier access
    - Fire hazard detection
    - Abandoned object detection in parking and other areas
    - Vehicle congestion and vehicle heat-map areas
    - Vehicles coming too close to people and blind turns, and other vulnerable areas

- **Elevators**
  - Lift misuse by renovation contractors, newspaper vendors and residents: by visual detection of a static object left unattended in order to keep the lift doors open & preventing the lifts from moving
  - Spillage: detecting liquid or other items (eg. litter, food, etc) on the lift floor
  - Lift Door not fully closed: detect if lift door is not fully closed/ opened
  - Leveling Problem: detect if lift floor is not aligned to outside landing when lift doors are open (assume no occlusion of landing when doors are open
  - Overloaded Lift: complement existing weight-based overload sensors with visual counting of the number of people in the lift (ensure count does not exceed maximum number of passengers allowed).
  - Low Light: detecting reduced level of lighting.
  - Vandalism (e.g., any behaviour that affects the internal or external appearance of the lift such as children drawing, loanshark painting etc.)
  - Crime (Robbery, Fights, Molestation etc.) (any conduct that is illegal under Singapore law)
  - People screaming/falling (e.g., people shouting for help when they are trapped in lift)
  - Abnormal activities (catch-all for any undesirable or unusual event/conduct that is not in this list).
  - Light/Lift button spoilt
  - Smoking
  - Children jumping or playing in the lift
  - Crowd Density Management
  - Detection / Counting / Estimation of people
  - Personal Tracking & Activity Detection without affecting privacy
  - Object Classification & Uncovering Intent

- **Airports**
  - Sentiment analysis for customer experience
  - Detect VIP, CIP and Loyalty Club/ Lounge member
  - Recognize black-listed people
  - Counting people, searching for people based on input data, sending alert if overcrowded at check-in counter
  - Detect people who need special care: children, disabilities,...

- Abandoned object alerts in different parts of airport
- Abandoned bags in conveyer belt
- Retail analytics for Airport retail stores

- **Airlines**
  - Track people based on uniforms/ clothing analytics;
  - Track vehicles, and alerts if too close to people
  - Same as Airport use-case when Airlines Ground staff managing airport analytics

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- **Highway Operators**
  - Foreign objects on the road
  - Illegal parking
  - Driving anomalies
  - Accident detection
  - Oversized vehicles detection
  - Intrusion - Plaza compound
  - Oversized vehicles detection
  - ANPR
  - Vehicle Counting and Classification

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7. **Smart City (including Smart Buildings)**
   a. Loitering detection
   b. Person climbing barricade
   c. Person collapsing
   d. Detection and Recognize the pattern of demonstration and conflicts in crowd
   e. Person/Face recognition

f. Detection and classification of human, animal and vehicle
g. Gesture recognition: Identification through gesture change
h. Parking violation
i. Behavioral Biometry: Identification through multiple behavior
j. Speeding vehicle
k. Accident detection
l. 'Vehicle of interest' tracking by color, speed, number plate
m. Helmet detection on two wheeler
n. Unwanted/ banned vehicle detection
o. Wrong way or illegal turn detection
p. Debris and Garbage detection
q. Garbage bin, cleaned or not
r. Identification of Garbage carrying tractor trailers which are not closed/covered as per municipal standard
s. Litter detection
t. Tracking of garbage truck movement and Quantity of garbage dumped at dumpsite
u. Garbage Truck detector needs to be integrated with ANPR for tracking
v. Intrusion Detection – Detect intrusion
w. Graffiti and Vandalism detection, Defacing/Destroying the public property and street furniture
x. People tracking
y. Fire detection at minimum 50 plus high risk locations.
z. Abandoned Object
aa. Object Removal: To triggers an alarm if the object is removed from user-defined zone
bb. Identification of vehicles carrying the construction materials and building demolish materials
cc. Auto Tracker: To detect and track movement in the field of view
dd. Adaptive Motion Detection: To detect and track object that enter a scene and then triggers an alarm when the object enter a user-defined zone
ee. Combination of Loitering and Intrusion
ff. Camera Sabotage: Triggers an alarm if the lens is obstructed by spray paint, a cloth or a lens cap
gg. Directional Motion: Generates an alarm in a high traffic area when a person or object moves in a specified direction

8.Manufacturing

- Count of number of people in the specified area and detecting if there area is overcrowded

- Geo-fencing: People should not be entering the area marked in blue box for safety and security reasons.
- Slot filled and empty- Count the filled and the empty slots in the tray
- PPE monitoring: compliance to personal protective equipment

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9.Retail

- Capture and provide video analytics of customer facial & body expressions in front of the displays in the showroom
- Data points such as time spent in front of display, number of customers in front of display to provide prediction of demand (which will be used to tied back to their warehouse stocking)
- **For Teller**:
  Manage working time in stores
  The attitude with customer: Not sad, angry,…
  Working behavior: Wearing uniform and staff card, don't sleep in table, giving objects to customer by 2 hands, ….
  Always available in desk when having customer waiting in queue
- **For Customer:**
  Screen Count Analysis
  Density heat map
  Demography insights: Age, gender
  In Store Dwell Time Analysis
  Emotion: happy, sad, neutral,…
  Facial recognition: staff, VIP customer

- **For Store**
  Identify the proper arrangement of the furniture in store: Control of the arrangement of tables, chairs, flower vase, demo device,… according to the correct position.

10. Logistics & Warehouses

- Defect detection and classification in the containers;
- Entry/ exit from Carpark of Lorry with Type and Lorry Number
- Classify vehicle type and number of containers for each prime mover and trace container number from top.

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11. Telcos - VAS

- Photo/ video analytics for photo cloud service
- People demography identification for enhancing Chatbots and AR applications
- IoT applications to enterprise clients (video analytics as a service)