Collaborative Video Surveillance

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Introduction
Collaborative Video Surveillance is concerned with the detection and tracking of individuals in a network of smart cameras based on image queries created using mobile phones. The increasing importance of security in cities and the possibility of using widely deployed CCTV and smart phones to help improve security motivates the design of such a system.

System Diagram

Design
• Mobile Application
  - Use smart phone to capture the suspect’s image
  - Crop the image to specify the exact location of the target within the captured image
  - Transmit the image to the base station

• Base Station
  - Receive image query from mobile phone and distribute it to client camera nodes
  - Visually present target-related information to the user based on data received from cameras

• Client Camera Node
  - Detect and track individuals using a combination of computer vision algorithms such as:
    o Stable Values for background calculation
    o Histogram Back Projection (HBP) for target detection
    o Kalman Filtering for target tracking

Evaluation
• System prototype operates as expected.

• The computer vision algorithms used have successfully detected and tracked different individuals in several scenes. Results may be inconsistent due to computer vision complexities.

• Future iterations of the system should allow the user at the server end to send feedback to camera nodes for more accurate results.

• Mobile user interacts with the system at the initial stages only.

Further Information

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