CIMPL: A Public Safety Tool based on Opportunistic Communication

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Agenda

- Introduction
- Motivation
- CIMPL application
- Small-scale Experiment
- Conclusions and Ongoing Work
Introduction

• Public safety guarantees social welfare
• Well-known approaches
  • Police presence, road maintenance task forces
• Society counts with citizens cooperation
  • Neighborhood watch (burglary, drug dealing)
• Safety measures can be
  • Reactive/Proactive: after/before an incident
  • Mitigating/Preventive: impact of an incident
Motivation

• Use of technology in public safety
  • Drones watching crowds, cameras monitoring

• Existing applications
  • Internet connectivity, account creation, user input

• Exemplary citizens are proactive
  • Willing to help in keeping their communities safe

• Increased capabilities of mobile personal devices
  • Processing, storage, wireless comm., sensors
CIMPL application

- Portuguese Cidadão exeMPLar
  - Exemplary, model citizen

- Requirements
  - Simple – citizens report by means of photos
  - Proactive – exploiting users willingness to help
  - Preventive – authorities can take fast actions
CIMPL application

Architecture
CIMPL application

User interface - Citizen
CIMPL application

User interface - Authority
Small-scale Experiment

CIMPL users (U1 and U2)
City Maintenance Authority (CMA)
Small-scale Experiment

- Take advantage of the opportunistic contacts
- Latency
  - Time the content remains at the device (7 min)
  - Transmission time irrelevant: photo has
    ~132 KB, taking 0.055 s to be transmitted
- Cost
  - 2 replicas are needed to achieve a successfully delivery given the epidemic nature of CIMPL
  - Replications may be a burden
    - Many users, various incidents, and limited storage
Conclusions and Ongoing Work

• CIMPL exploits opportunistic contact for the exchange of public safety data, having a positive impact on social welfare

• Photo tagging to be done automatically
  • In current version, users do the tagging
  • OpenCV computer vision library (recognition of the incident and authority)

• Employing social-based opportunistic approach
  • Current version relies on an epidemic
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