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

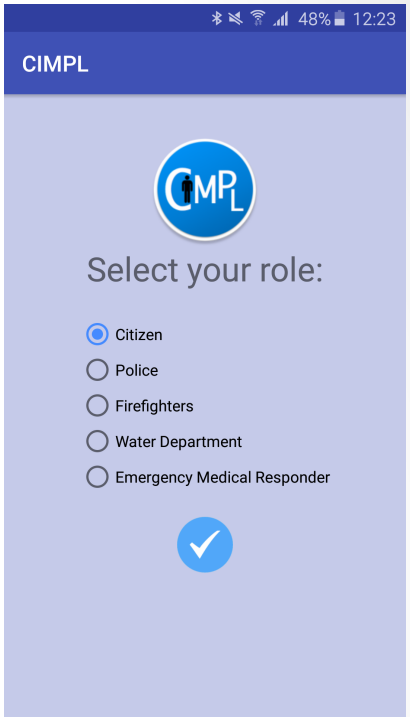
- Use of technology in public safety
  - Drones watching crowds, cameras monitoring
- Existing applications
  - Internet connectivity, account creation, user input
- Exemplary citizens are proactive
  - Willing to help in keeping their communities safe
- Increased capabilities of mobile personal devices
  - Processing, storage, wireless comm., sensors

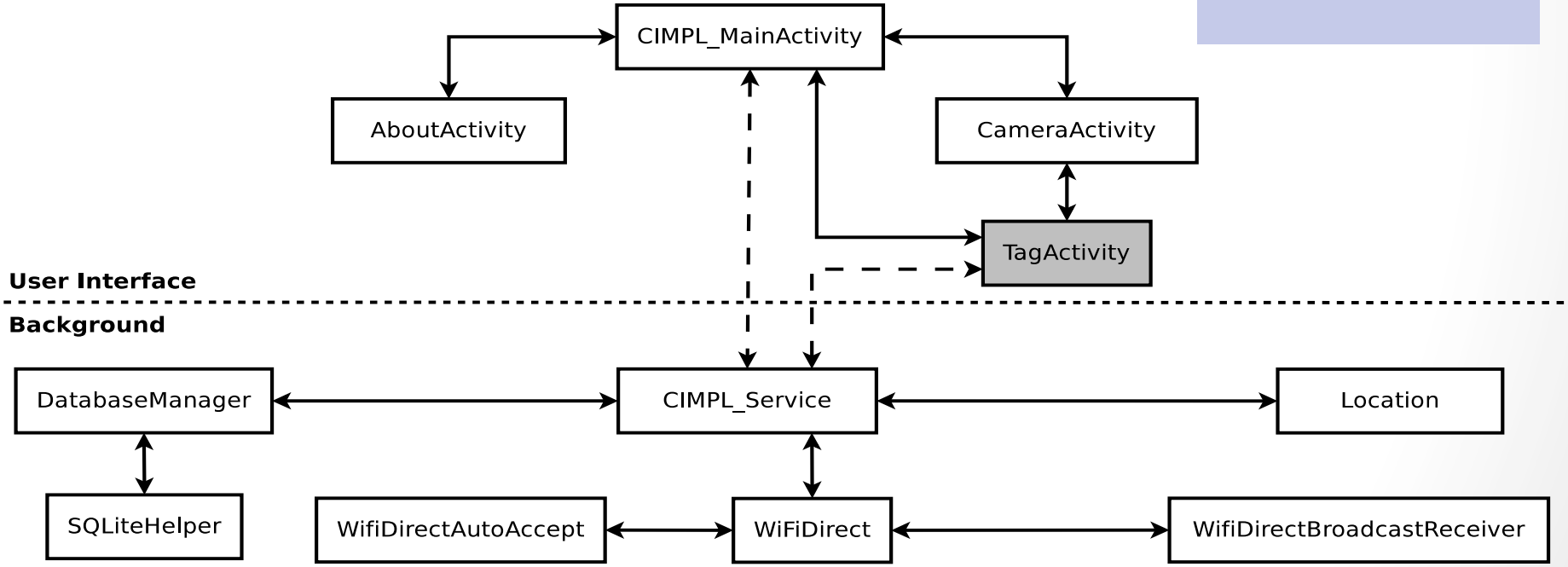
CIMPL application

- 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

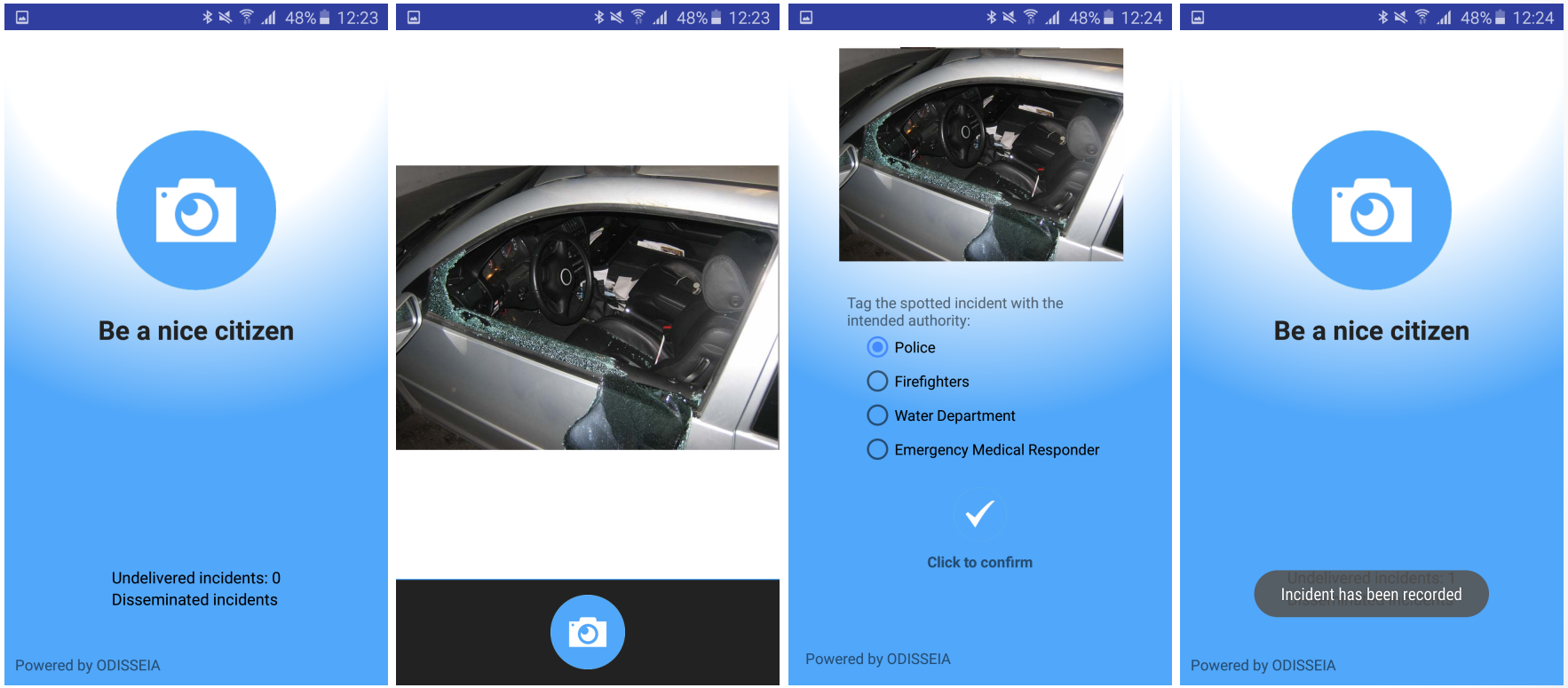
Architecture





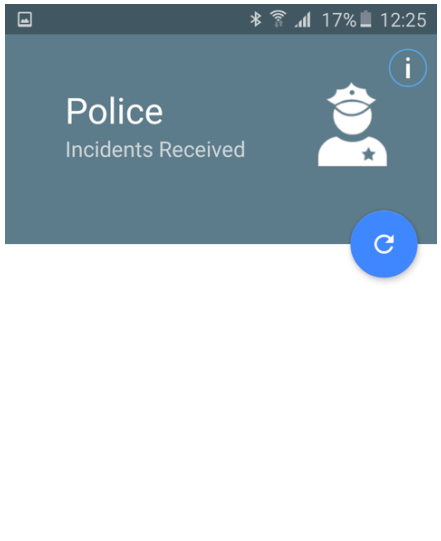
CIMPL application

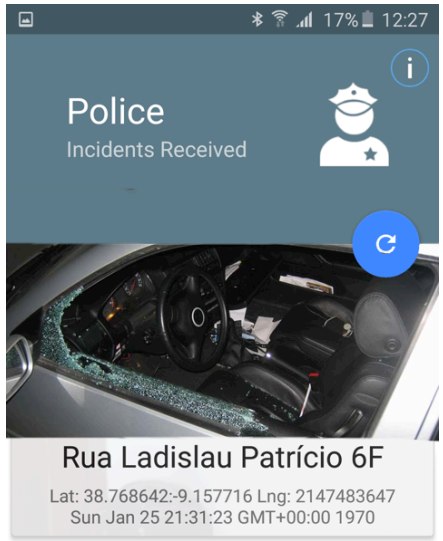
User interface - Citizen



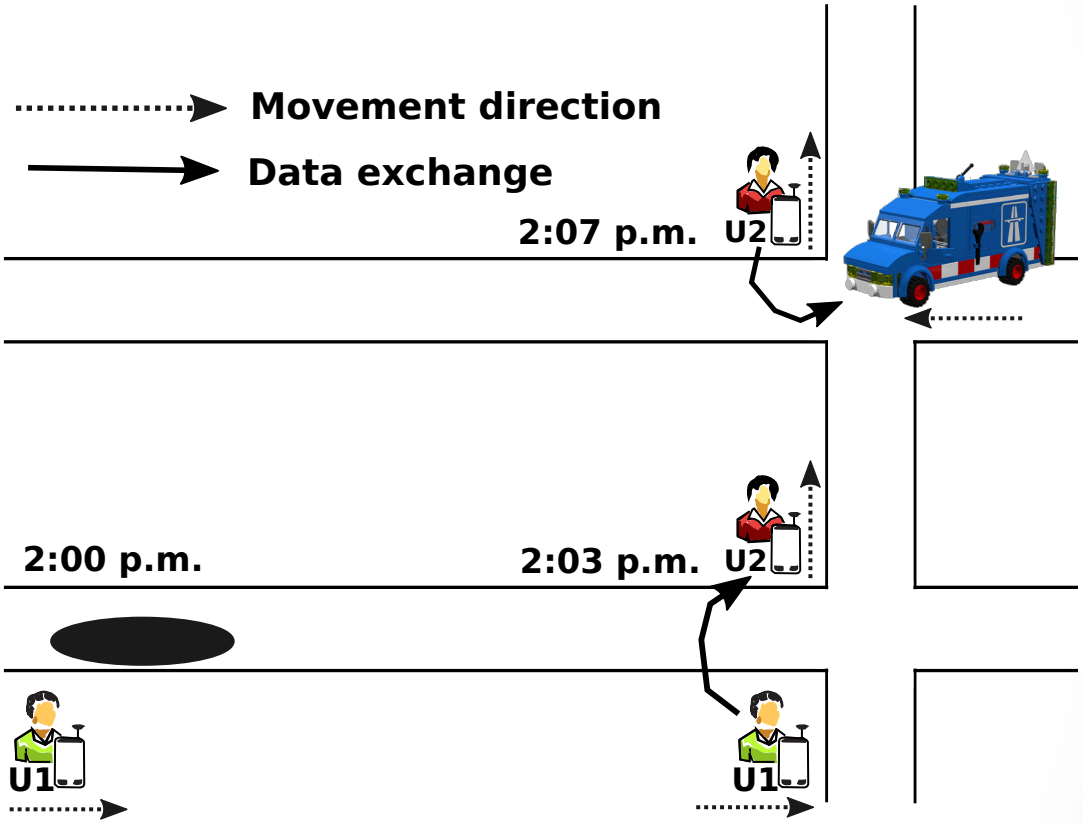
CIMPL application

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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Mahalo
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EskerrikAsko
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Trugéré
Misaotra
Akpé
Gràçie
MaloTeOfa
Tanmirt
Akiba
Nanni
Tau
KopKhunKrap
Dhanyabaad
Mochchakkeram
GoRaibhMaithAgat
KyayTzuTinPaTe
Mauruuru
Yekeniele
AabhariAahe
TeşekkürEderim
Sobodi
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