

SOS4ALL



by Isaac Newton Kissiedu, Yanning Wang, Ching-Ting Chia

This article proposes an innovative solution using smartphone and Web Mapping technologies to address language barriers in emergencies. It involves a mobile app collecting precise GPS locations and emergency details for transmission to a spatial database. Incident locations are visualized on map, categorized by emergency service type, and officers can access details interactively. The study focuses on Austria, implementing a spatial database, web application, and mobile app with PostgreSQL, Leaflet, and Android Studio. Comprehensive testing validates the system's user-friendly interfaces and effective functionality, improving communication, navigation, and safety for foreigners during emergencies in Austria.

INTRODUCTION

Austria's geographic position in Central Europe has shaped its cultural exchange and trade routes [1]. It attracts foreigners with its high standard of living and diverse landscape [2]. However, language barriers pose challenges in emergency situations. Cartography offers a solution by using visual maps to aid communication. Our concept utilizing smartphone and web mapping technologies aims to enhance the existing SOS system, providing accurate location information and emergency details for effective rescue operations [3].

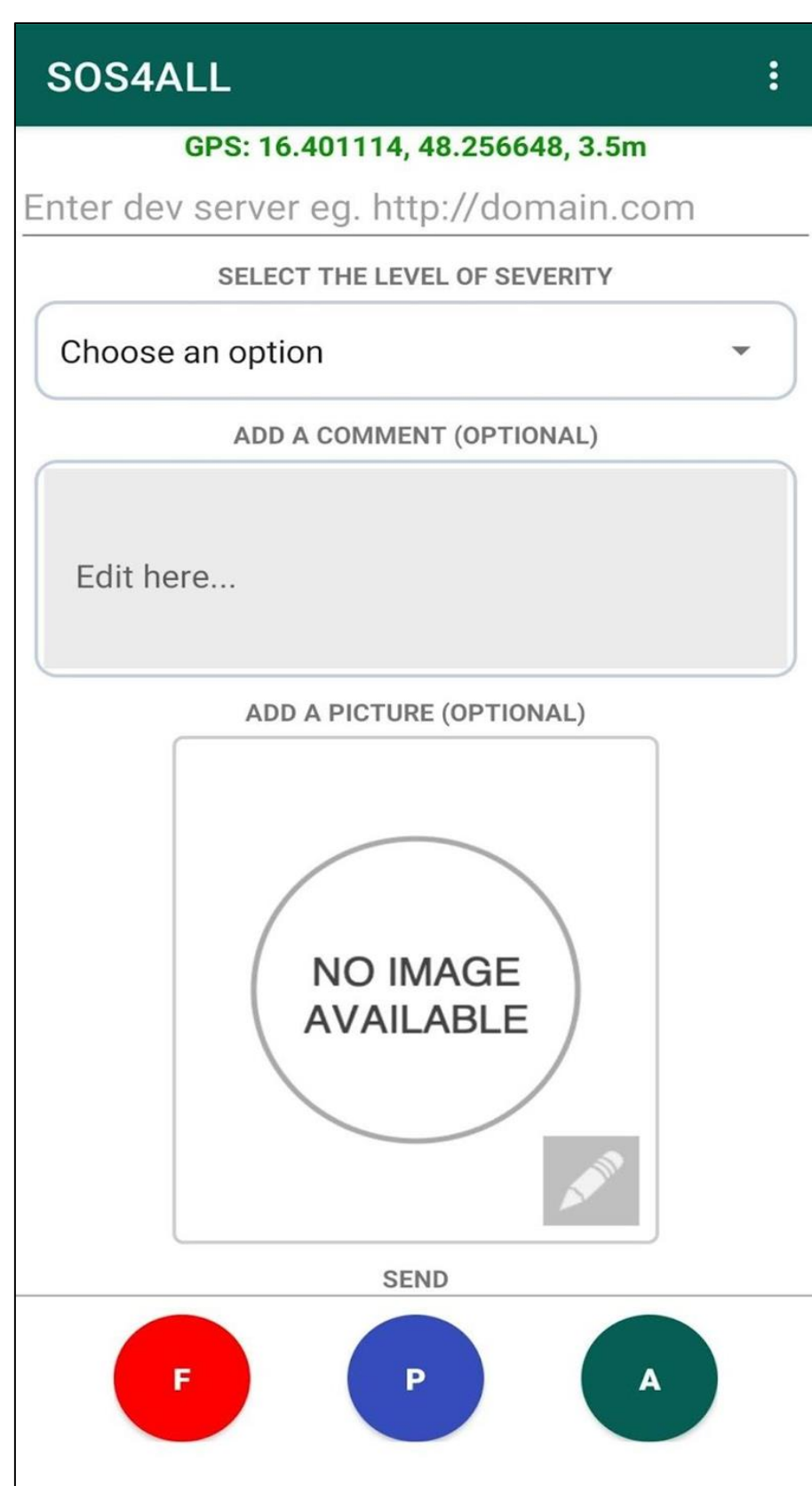


Figure 2: Mobile Application

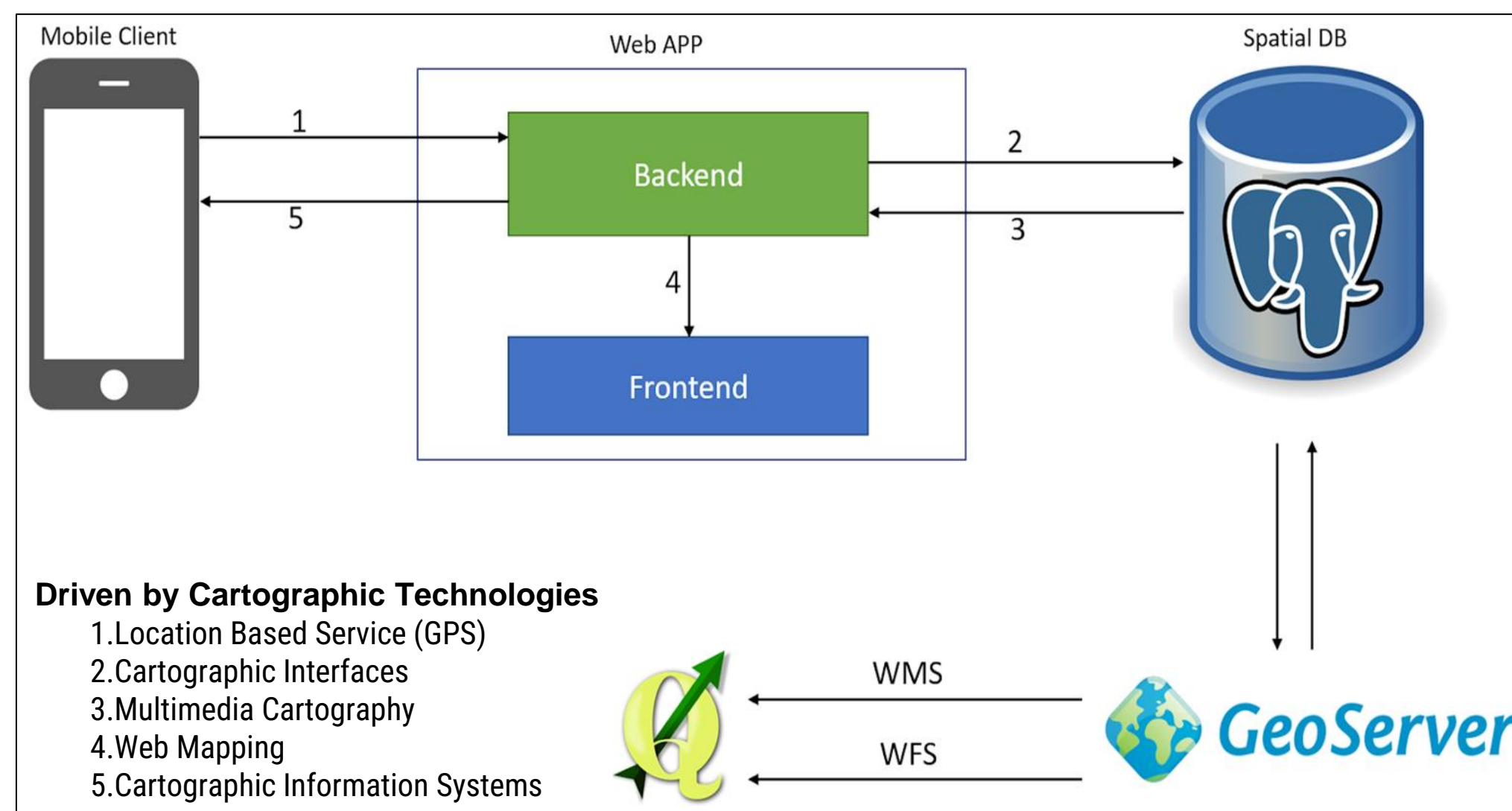


Figure 1: Conceptual Framework

MOBILE APPLICATION

The Android app, developed in Android Studio using Java, utilizes built-in GPS, file access, gallery and camera features, and network connectivity. It sends a form together with the GPS location and photo attachment to the server through HTTP POST requests, encoding and validating form data before processing it in the PHP backend and storing it in the database.

SPATIAL DATABASE

The system is backed by a spatial database consisting of two tables: the Austria boundary and SOS reports. Moreover, an Insert Trigger is created on the SOS reports table to create point geometries on-the-fly which is necessary to allow interoperability with Geoserver

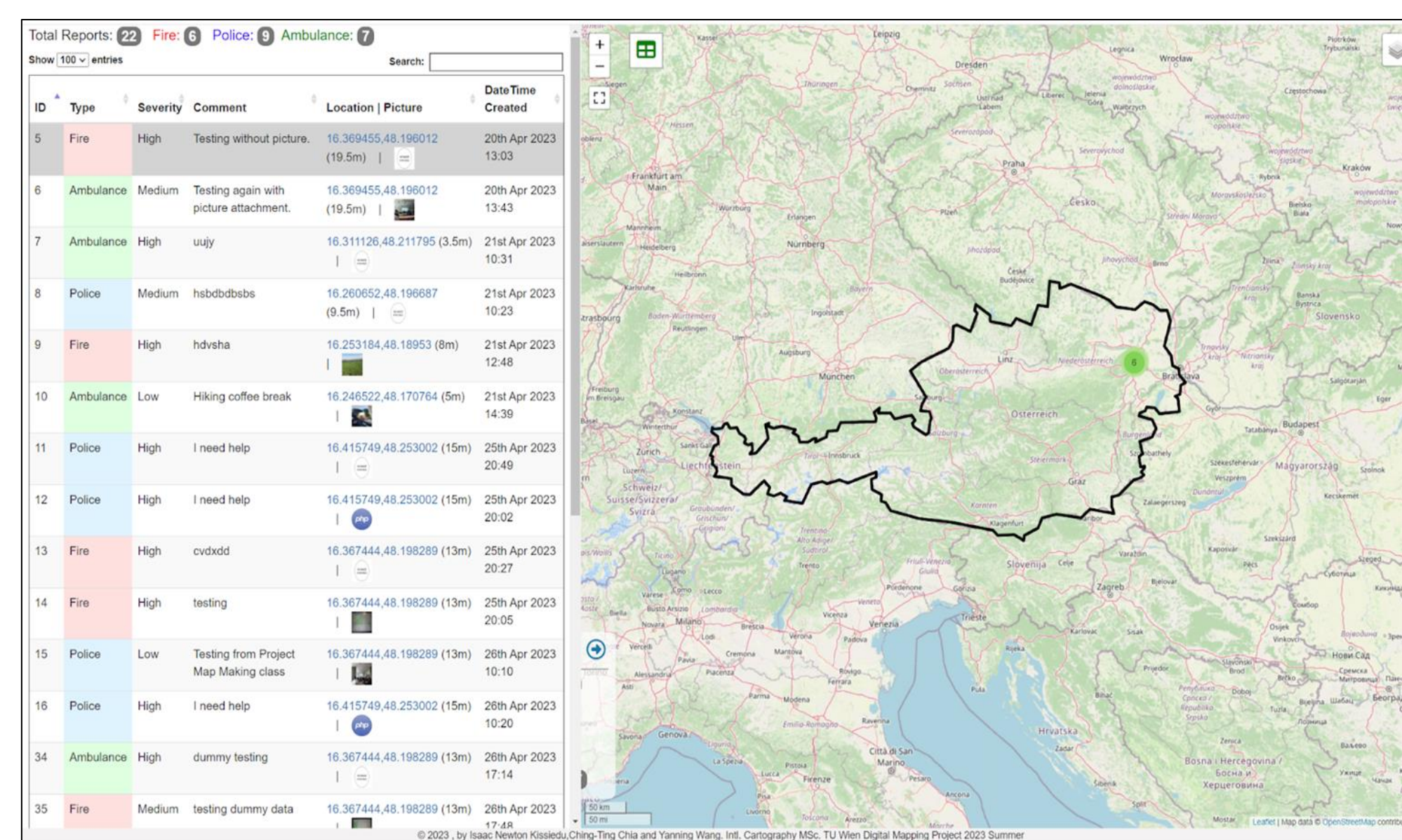


Figure 3: Web Application

for delivering WMS and WFS data to client application such as QGIS.

WEB APPLICATION

The backend developed in PHP receives SOS alerts from the mobile app and stores them in a PostgreSQL/PostGIS database. Real-time functionality is achieved through an external message broker (PubNub) where alerts are published as JSON messages and pushed to subscribed browsers. The frontend includes an interactive map with basemaps from OpenStreetMap, ESRI, and Google. Overlay layers for Fire, Police, and Ambulance SOS alerts are fetched as GeoJSON data using AJAX and styled with red, blue, and green dots.

IMPRINT

Digital Map Project
Summer Semester 2023
Vienna University of Technology

Isaac Newton Kissiedu

Ching-Ting Chia

Yanning Wang

SUPERVISOR

Ignateva Olesia, M.Sc.
Researcher and Lecturer at the Research
Division Cartography, TU Wien

KEYWORDS

Incident, Emergency, Location Based
Service, Web Mapping, Spatial Database

LINK

<http://sos4all.wheregeospatial.com>



REFERENCES

- [1] Faßmann, H. (2004). Geography in Austria. *Belgeo. Revue belge de géographie*, (1), 17-34.
- [2] Gass, V., Schmidt, J., Strauss, F., & Schmid, E. (2013). Assessing the economic wind power potential in Austria. *Energy policy*, 53, 323-330.
- [3] Staněk, K., Friedmannová, L., Kubíček, P., & Konečný, M. (2010). Selected issues of cartographic communication optimization for emergency centers. *International Journal of Digital Earth*, 3(4), 316-339.

This project was created within the Cartography M.Sc. programme – proudly co-funded by the Erasmus+ Programme of the European Union.