

# Emergency Response Multi-Agent System

## Design Presentation

Team Name

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# Outline

- 1 Introduction
- 2 City Selection
- 3 Environment
- 4 Tools
- 5 Agent Crews
  - Emergency Services
  - Firefighters
  - Medical Services
  - Forensics Team
  - Public Communications

# Introduction

- Multi-agent system for fire-related emergencies in Lloret de Mar
- Five specialized response teams using CrewAI:
  - Emergency services
  - Medical services
  - Firefighters
  - Public communications
  - Forensics team

# City Selection Process

- Selection criteria
- Candidate cities
- Evaluation metrics

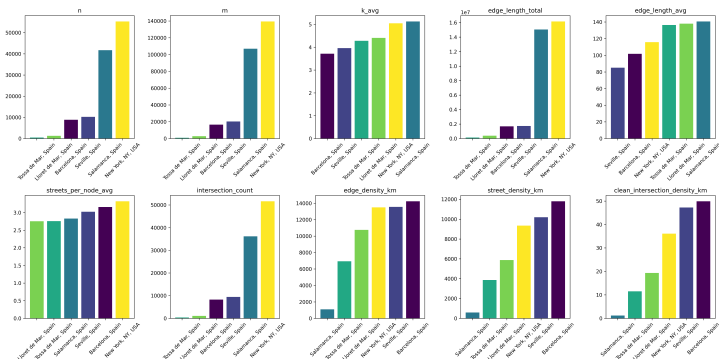
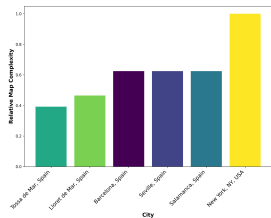


Figure: Statistics of map complexity of candidate cities

# City Selection

Final selection: **Lloret de Mar**



**Figure:** Relative map complexity



# Environment Properties

- Accessibility: Partially Observable
- Determinism: Non-deterministic
- Episodicity: Non-episodic
- Dynamics: Dynamic
- Continuity: Continuous

# Agent Tools

- Communication Channel:
  - Enables **communication** between crews.
  - Each crew has a **facilitator** agent with access to it.
- Database Management:
  - Grants access to **persistent** data.
  - **Information** agents can read and update databases.
  - Other agents may query to **specialized knowledge** bases.

# Agent Crews Overview

Five specialized teams:

- 1 Emergency Services
- 2 Firefighters
- 3 Medical Services
- 4 Forensics Team
- 5 Public Communications



# Emergency Services

- Emergency Call Agent
  - Main task: Receive and assess calls
  - Type: Interface agent
- Notification Agent
  - Main task: Relay information
  - Type: Facilitator agent

# Firefighters

- Fire Chief
- Equipment Technician
- Fire Combatant

# Medical Services

- **Medical Services Operator:**

- **Facilitator** agent.
- Capable of **communicating** with other crews.

- **Hospital Coordinator:**

- **Information** agent
- In charge of **managing** hospital **resources**.

- **Paramedic Teams:**

- **Collaborative** agent
- Deployed in **teams** to aid at the emergency site.

# Forensics Team

- **Forensics Operator:**
  - **Facilitator** agent.
  - Capable of **communicating** with other crews.
- **Forensics Coordinator:**
  - **Information** agent with access to a **database**.
  - Manages resources and information for the forensics team.
- **Coroner:**
  - **Collaborative** agent.
  - Determines the cause of death.
- **Investigator:**
  - **Collaborative** agent.
  - Investigates the cause of the fire.

# Public Communications

- **Communications Operator:**
  - **Facilitator** agent.
  - Capable of **communicating** with other crews.
- **Archive Keeper:**
  - **Information** agent.
  - **Stores** and **retrieves** incidents.
- **Article Writer:** Drafts and refines public announcements.
- **Mayor:** Approves and aligns communications with city standards.
- **Social Media Commentator:** Engages the public with morale-boosting commentary of the articles.

# References

- Wooldridge, Michael. An Introduction to MultiAgent Systems. 2nd ed., John Wiley & Sons, 2009. ISBN 978-0-470-51946-2.
- Wooldridge, Michael. "Properties of Intelligent Autonomous Agents." YouTube, 26 Feb. 2010,  
[https://www.youtube.com/watch?v=vID-\\_uIfAvg](https://www.youtube.com/watch?v=vID-_uIfAvg).