

Instituto Tecnológico y de Estudios Superiores de Monterrey



Modeling of Multi-Agent Systems with Computer Graphics (101)

Evidence 2. Progress and presentation of the challenge.

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Campus Guadalajara

Team formation

Tabla 1.1

	Strengths	Expectations for the block	Expectations for the team	Team Commitments
Karen Valentina	When working in a team, I believe my greatest strengths are leadership and empathy, as they allow me not only to guide others toward a common goal but also to listen and value every voice within the group. My communication skills help me build trust and convey ideas clearly, while my organizational abilities ensure that projects move forward in a structured way. I truly believe that a successful team is not built solely on results, but on the commitment of each member to grow together and support one another throughout the process.	My expectations for this block are to challenge myself academically, strengthen my teamwork and leadership skills, and apply what I learn to real-life situations. I hope to gain not only technical knowledge but also a deeper understanding of how to use it to create value and solve problems. I expect this block to push me out of my comfort zone, to connect with my peers through collaboration, and to help me grow both personally and professionally.	My expectations for the team are to build a collaborative environment where every member feels valued and motivated to contribute. I hope we can communicate openly, respect each other's ideas, and combine our strengths to achieve our goals. I believe that by supporting one another and maintaining accountability, we can not only deliver great results but also enjoy the process of working together.	As a team, we commit to respecting each other's ideas, communicating with honesty and openness, and holding ourselves accountable for our responsibilities. We will support one another in challenges, celebrate our achievements together, and ensure that every member feels included and heard. Above all, we commit to working with integrity, collaboration, and dedication to reach our common goals.
Guillermo	Skills in problem spotting and solving, proficiency using a variety of tools ranging from Matplotlib,	Learn more, especially about tools like Blender and improve my knowledge about agents and multiagent systems	To handle communication effectively and to have an effective collaborative teamwork in which we can all work	Communicate properly with my teammates and reach out to them in case any of them needs help or can help me.

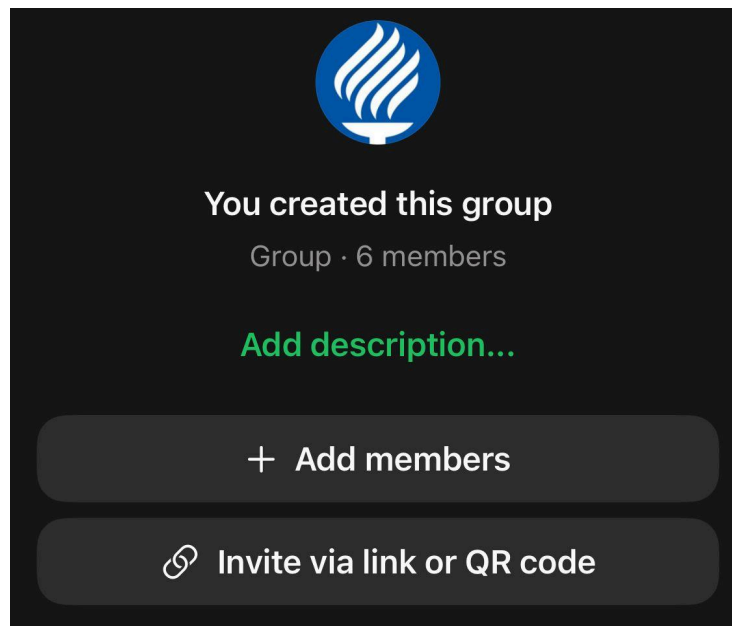
	Python, C# and C++ to Blender and other software tools. Critical thinking and collaborative teamwork.	and their applications.	properly and learn from one another.	
Luciano	Leadership within the team, strong knowledge and application of UX/UI design, frontend development, and visual design applied to the project.	To strengthen my abilities in computational modeling and multi-agent systems.	To integrate different skills from each member in order to create a complete and functional solution.	Actively participate in the development process.
Daniel	Strong analytical thinking and attention to detail. Ability to solve complex problems and refine solutions until they are precise and effective.	I could benefit from streamlining my work process to avoid over-refinement, staying flexible when perfection isn't necessary, and balancing technical depth with higher-level perspective.	To be able to collaborate without any major issues while working. Taking everyone's strengths to the max.	Help with what I can and try to keep good communication with my team at every moment.
Tarik	Experience in IT security, SAP BI, and SAP BTP. Skilled at identifying security risks and proposing preventive measures, combined with technical expertise in building Business Intelligence solutions and cloud-based SAP environments.			
Mariano	My main strengths in teamwork are analytical thinking, adaptability, and problem-solving. I am able to approach	To expand my knowledge of multi agent system so that I can do a project related to this, and also be able to do pretty much anything I want in Blender	The expectation for the team is to maintain open communication, mutual respect, and a spirit of collaboration. Everyone should feel included and	To make sure everything is done correctly , organize the pace of the team so that we don't run out of time

	challenges with logic and structure, which helps in making informed decisions.	that is easy,	valued, contributing their ideas while also listening carefully to others.	
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Creation of collaborative work tools

Github Repository: <https://github.com/Lucianogrc/Person-of-Interest>

Communication tool: <https://chat.whatsapp.com/KhnAzQnhJU398Bagi6mb0G>



Formal proposal of the challenge

The challenge is to come up with a multi-agent system that will enable an autonomous Micro Aerial Vehicle (MAV) to locate and identify a "person of interest" within a specified area of search. The MAV will be provided with a text description of the target (E.x: A person in orange jacket and yellow helmet) and GPS target coordinates.

The problem is to develop a system where the MAV can interpret the description, automatically navigate, recognize the individual through computer vision, and perform a precise autonomous landing near the target.

Identification of Involved Agents:

MAV (Micro Aerial Vehicle) / Swarm

- Autonomous drone agents that can move, sense, communicate, and coordinate.
- Responsibilities: surveillance, tracking, data collection, relaying information.

Ground Control Station (GCS)

- Centralized control agent, receives input from MAV swarm, sends commands back.
- Responsibilities: mission planning, coordination, human-in-the-loop decision making.

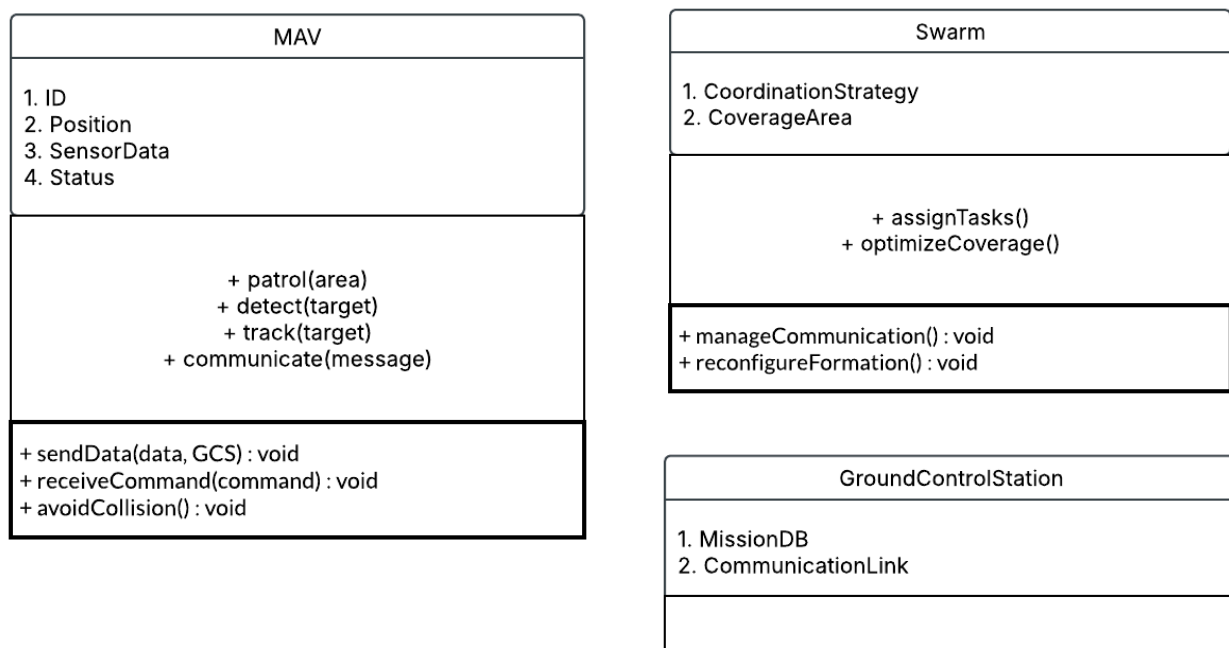
Person of Interest (PoI)

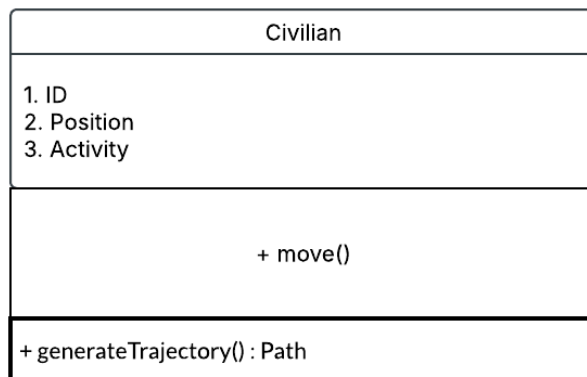
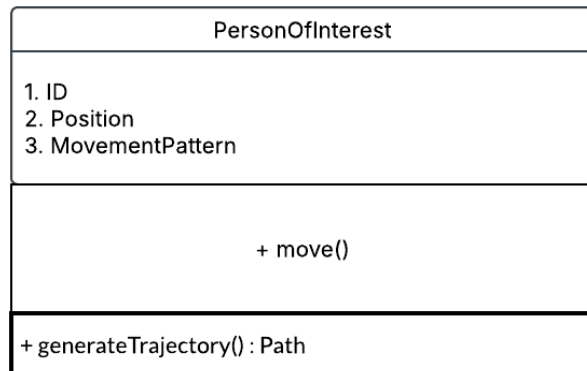
- The target entity that needs to be detected.
- Responsibilities: move through the environment.

Civilians / People

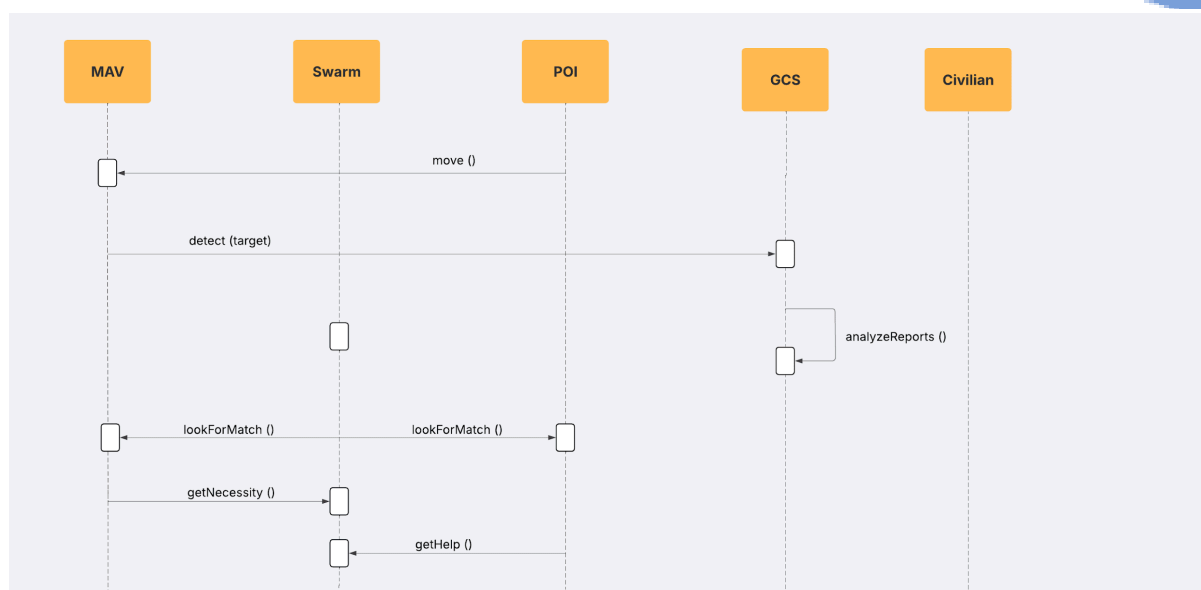
- Other human agents not directly involved but affected by MAV operations.
- Responsibilities: move, interact with the environment.

First Iteration: Agent Class Diagram:





First Iteration: Agent Interaction Diagrams



Work Plan and Learning Outcomes

Pending Activities and Estimated Timeframe

Table 1.2

Activity	Responsible	Due Date	Estimated Effort
Finalize Class Diagrams of Agents (UML)	Daniel	20/08/2025	4 hours
Finalize Interaction Diagrams of Agents	Mariano	27/08/2025	3 hours
Implement Navigation Agent Module	Guille	03/09/2025	6 hours
Implement Perception Agent Module	Guille	03/09/2025	6 hours
Implement Decision-Making Agent Module	Daniel	03/09/2025	6 hours
Integrate MAV with all agent modules	All team	10/09/2025	5 hours
Develop and finalize graphical interface for simulation	Luciano	10/09/2025	5 hours
Consistency review and final documentation	All team	12/09/2025	3 hours

Team Work Plan for Review 2 (Week 2, 10%)

Table 1.3

Task	Responsible	Due Date	Estimated Effort
Present initial Class Diagrams of Agents	Daniel	27/08/2025	10 min
Present initial Agent Interaction Diagrams		27/08/2025	10 min
Describe agent types and functions	All team	27/08/2025	15 min
Explain MAV's mission flow and agent communication	Mariano	27/08/2025	10 min
Review graphical consistency and formatting	All team	27/08/2025	5 min

Team Work Plan for Review 3 (Week 4, 10%)

Table 1.4


Task	Responsible	Due Date	Estimated Effort
Present final Class Diagrams and Interaction Protocols		10/09/2025	15 min
Submit at least 60% of agent implementation code	Daniel	10/09/2025	10 hours
Submit at least 60% of graphical simulation/interface code	Luciano	10/09/2025	8 hours
Update work plan and learning acquired	All team	10/09/2025	2 hours

Luciano Luna García –  Yellow

Karen Valentina Mariel Villagrán –  Blue

Guillermo Baltazar y Nungaray –  Green

Daniel Eden Wynter González –  Purple

Tarik Maina Gichuki –  Orange

Mariano Sánchez Bermúdez –  Red