SeaSec: DroNets for Maritime Border and Port Security

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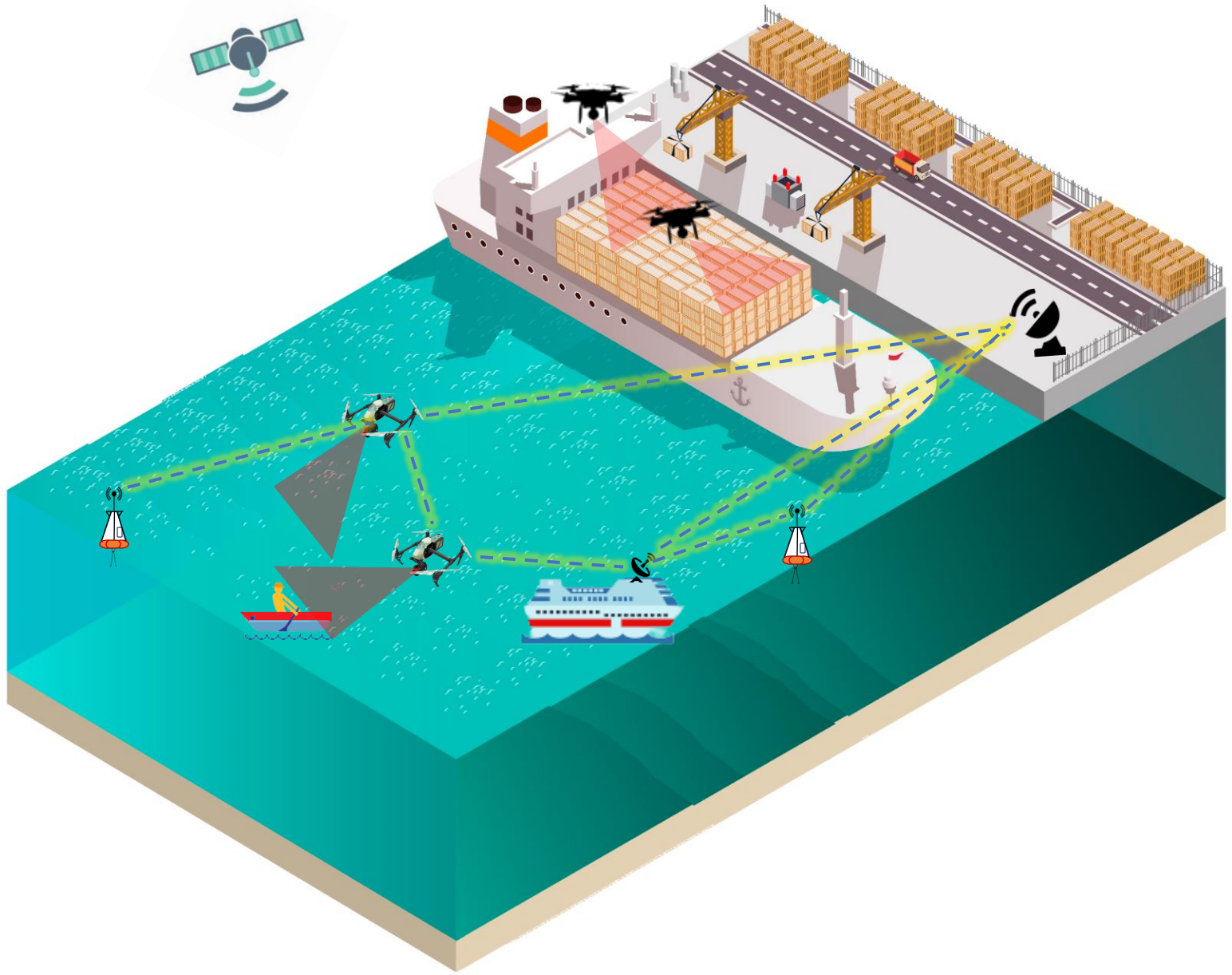
SeaSec : DroNets for Maritime Border and Port Security

Goals:

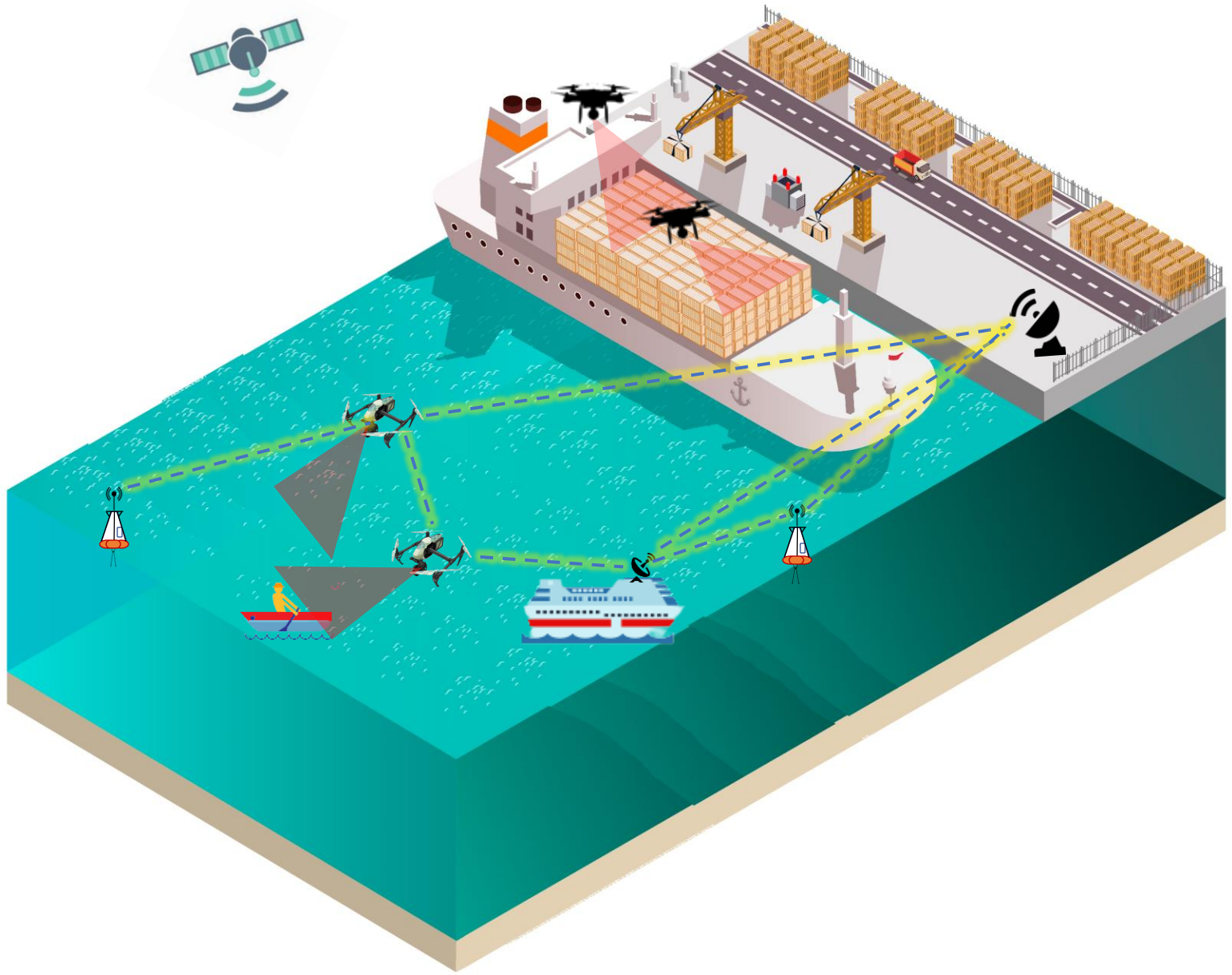
- Global Monitoring
- Surveillance of specific targets
- Pollution Detection
- Search and Rescue



SeaSec : Tasks

For each scenario/goal we have several problems to address:

- Trajectory Planning
- Communication protocols
- Distributed cooperation
- Task Assignment
- Prototyping
- ….

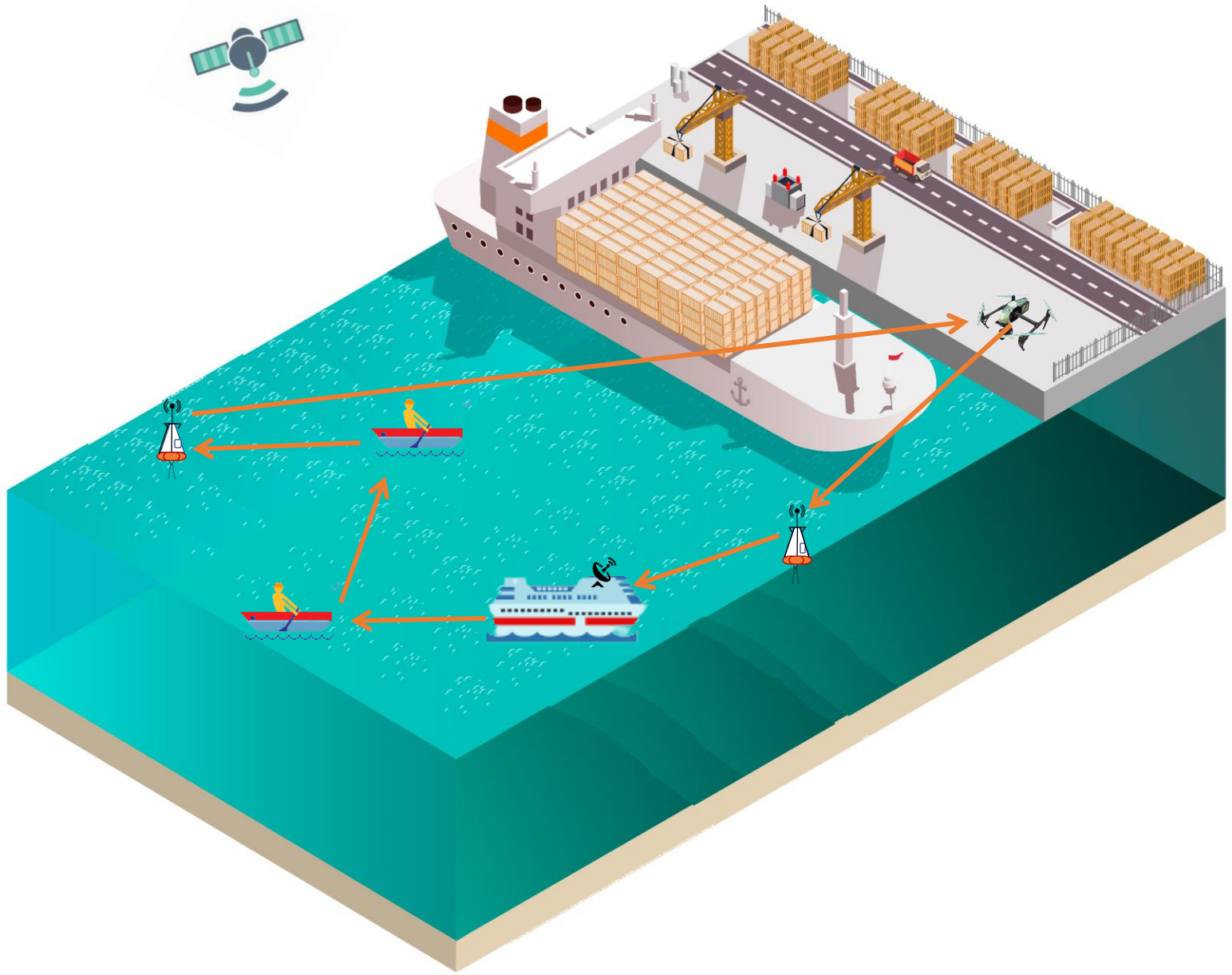


SeaSec : Trajectory Planning

Goal: Visit a set of points under constraints

Constraints:
- Energy
- Time
- Time Window
- …

Minimize Time, Energy, Cost Function



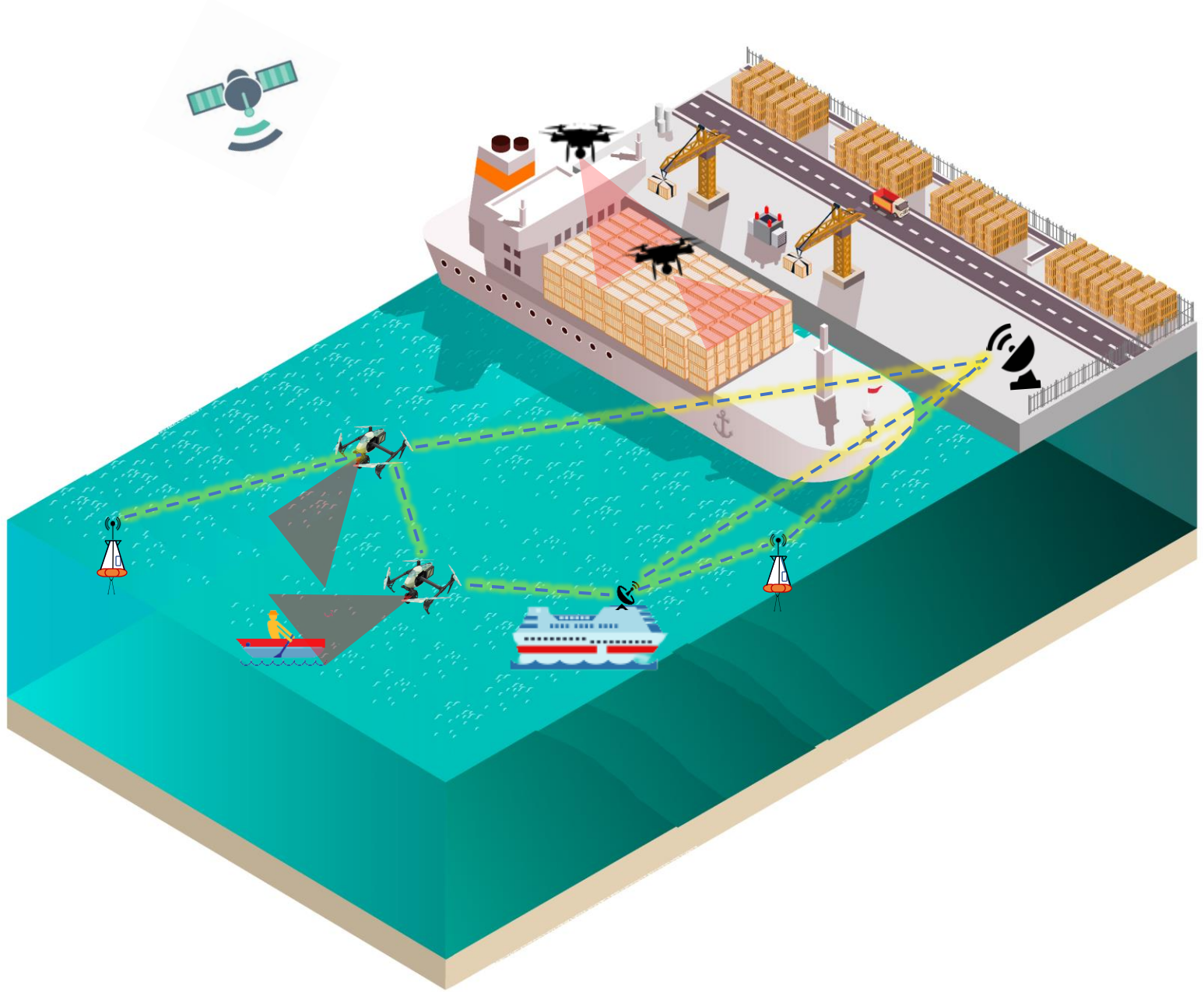
SeaSec : Communication Protocols

Goal: Enable communication between drones/ships/base stations

We can have constraints as well:

- Energy
- Time
- Distance

Mac Protocol, Routing, Technology, …



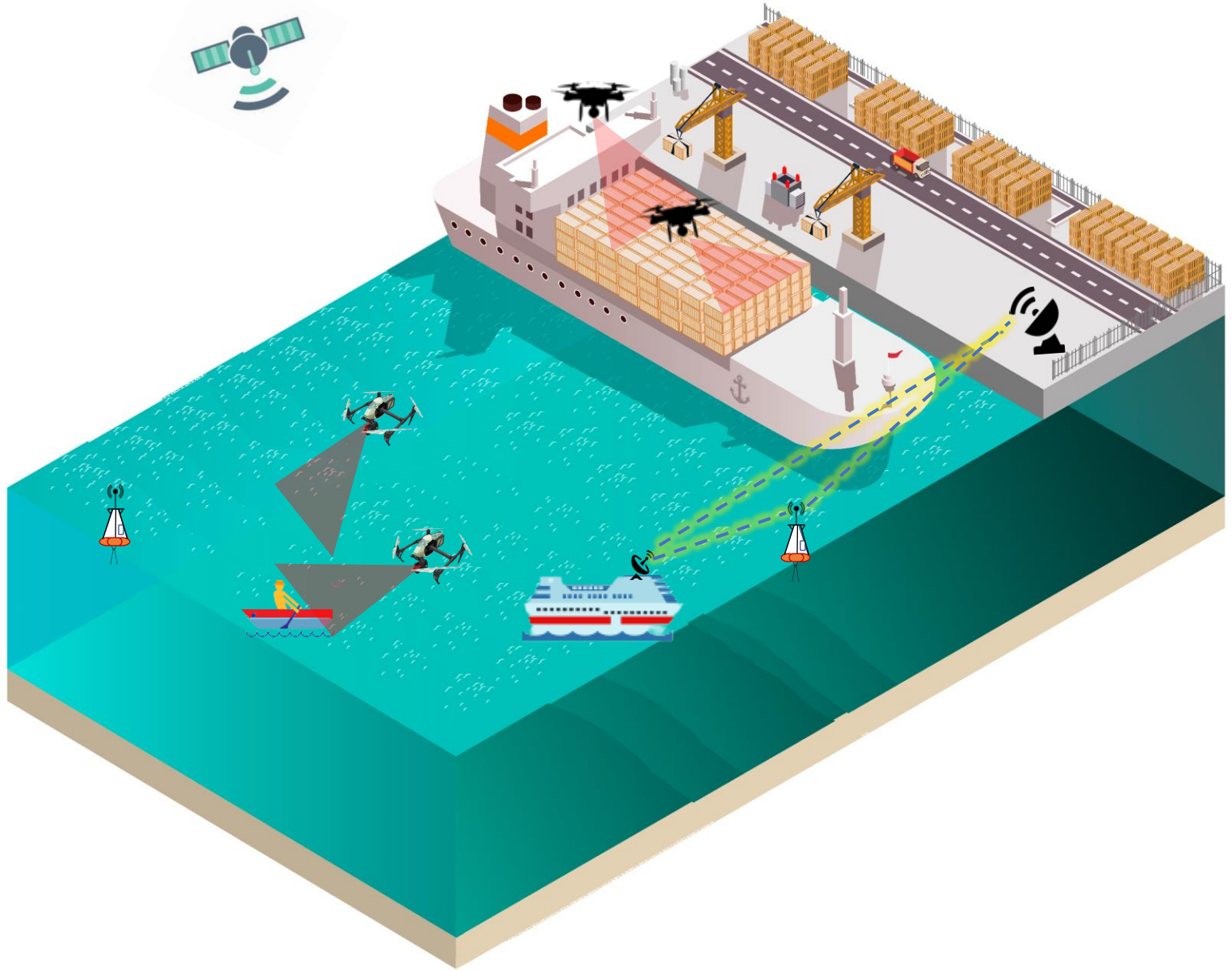
SeaSec : Distributed Cooperation

Goal: Enable cooperation between drones without explicitly communication

We can have constraints as well:

- Energy
- Time
- Distance

E.g., Visit points without redundancy



SeaSec : Task Assignment

Goal: Distribute tasks/jobs to several drones

We can have constraints as well:

- Energy
- Time
- Distance

We may want to optimize the assignment to reduce energy consumption or execution time.

E.g., Which drone send to the Task!

SeaSec : Prototyping

Goal: Build and prototype drone platforms with communication capabilities.
Make them fly and test them on real fields.

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Opportunities:

- Thesis
- Extension of the Exam / Project
- Collaboration
- Percorso di eccellenza*:
  - ***Networks of aerial drones for critical environment monitoring*** (Novella Bartolini, Gaia Maselli)

* https://docs.google.com/spreadsheets/u/1/d/1pvUOq-nZXvxlPLkOZIbY-ly74swNNU2b6FHwRV3eOwA/edit

Acknowledgements and References

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