Marine Systems & Robotics
Outline

http://impact.uni-bremen.de/

Blue Economy Data

- "All economic activities related to oceans, seas and coasts. It covers a wide range of interlinked established and emerging sectors" *European Commission*

- Ocean assets US$24 trillion, *WWF*

- 3.5 millions jobs in the EU

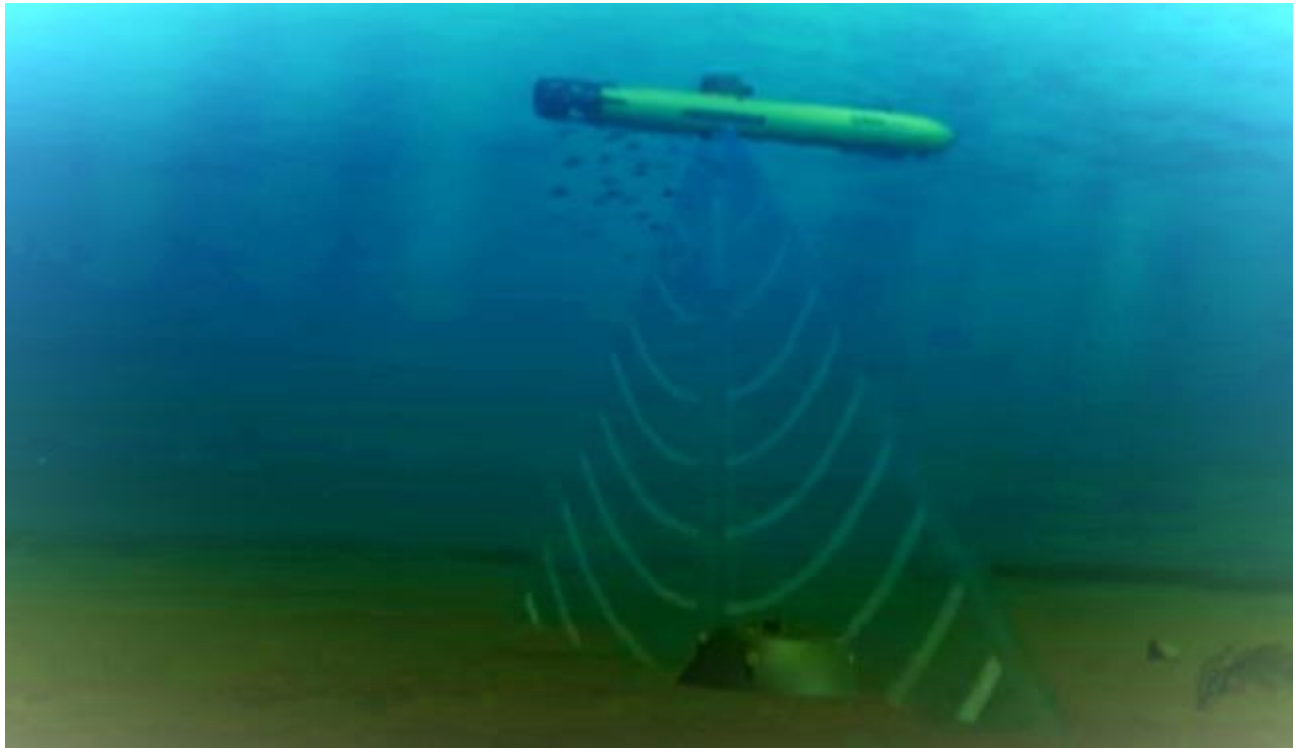
- 71% Earth surface is covered by water

Application Domains: oil and gas

Application Domains: marine science

Application Domains: archaeology

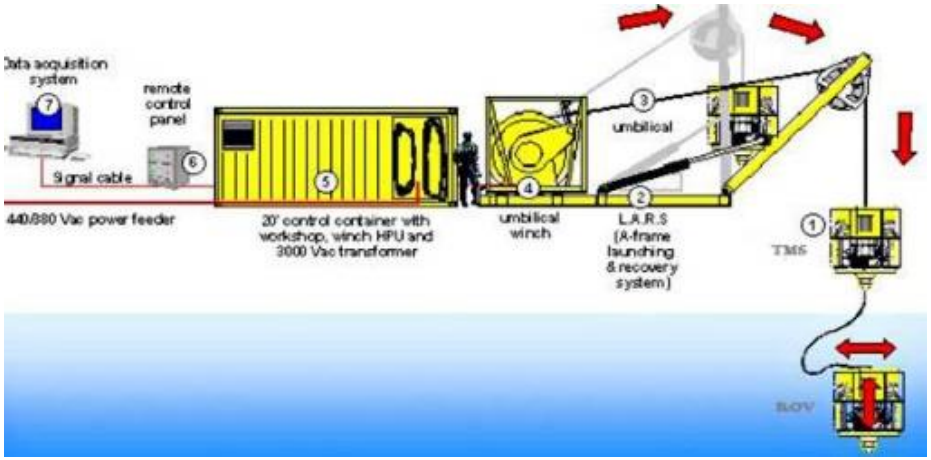
Application Domains: defence



Challenges

Example of difficulties of human-driven robot

Remotely Operated Vehicles - ROV



Remotely Operated Vehicles - ROV

+ Human in the loop
+ Human decides
+ Lights
+ Live video-feed

- Human in the loop
- Human decides
- Support Vessel needed
- Pilot needed

→ Cost very high!

Cave exploration?
Under-ice exploration?
Cable management?

Autonomous Underwater Vehicles - AUVs

Towards Intelligent and Capable Vehicles

Teleoperated, no autonomy

Smart ROV (e.g. autopilot)

Hybrid ROV

Autonomous, but "blind"

On-board sensor processing

On-board decision-making

Towards Persistent Autonomy

marum · Jacobs University · TAL TECH · National Technical University of Athens · University of Zagreb · Universitat de Girona · Técnico Lisboa

Topics we will look at:

- Components
- AUV Modelling
- Control of Underwater Robots
- Localisation in Challenging Environments

- Use Case: Diver-Robot Interaction

Credits

Erasmus+ Strategic Partnership IMPACT

- Ralf Bachmayer
- Corina Barbalata
- Andreas Birk
- Patryk Cieslak
- Fausto Ferreira
- Kostas Kyriakopoulos
- Szymon Krupinski
- Maarja Kruusma
- Francesco Maurelli
- Nikola Miskovic
- Đula Nađ
- Antonio Pascoal
- Pere Ridao

Web Interface: Moritz Bergenthal, Abhilekh Pandey

Questions ?