

Student assignment “Your Extreme 2021”

“Ocean of opportunities and challenges”: Man’s best friend

Our oceans cover more than 70 per cent of the world’s surface. Eighty per cent of them are more than 3,000 metres deep and 90 per cent are still unexplored. We know that the oceans contain solutions to many of the greatest challenges we are facing but extending our use of oceans will also require new technology, both to protect people carrying out difficult operations and to safeguard our environment and climate in a sustainable manner. In order to succeed, we must have an integrated approach to the management and use of oceans.

In the film *Nordsjøen* (The North Sea), which will be in cinemas from 29 October, Eelume, a subsea robot, plays the role of an invaluable tool in a rescue mission in the North Sea. In this rescue mission, technology plays a vital part in demanding, extreme surroundings where it would be very risky to use people.

Technology for sustainable oceans

As an internationally leading ocean nation, Norway has taken the lead in developing technology that contributes to the safe, sustainable management of ocean resources. Artificial intelligence (AI) and autonomy allows new types of operations. These include using satellite surveillance technology to monitor illegal fishing, the development of autonomous subsea drones to monitor and map bioresources in the ocean, the development of environmentally friendly transport technology, and the development of sustainable energy sources such as offshore wind.

To solve some of the biggest challenges the world is facing regarding food production, energy and transport, we are dependent on developing new ways to manage the oceans and completely new technologies and solutions. That will require radically innovative ideas and solutions.

From autonomy and artificial intelligence to artificial emotions

We usually think of technology as being fully controlled by a person in some way or other. With the development of artificial intelligence and autonomy, we are entering an era when robots and people will collaborate more seamlessly, and where the need for human involvement in the planning and execution of operations will be very different.

In light of the rapid technological developments taking place, the seamless interaction between people and machines is increasing. Researchers in both technical and social studies subjects are therefore discussing how and whether robots and machines are to have moral qualities that enable them to relate to human feelings. This may be the start of the development of machines and technology with artificial emotions (AE). This allows entirely new concepts for «Manned-Unmanned Teaming».

The assignment: Robots – man’s best friend

This year’s assignment deals with how technology can ensure the sustainable management and use of the oceans and help to save human life in critical situations.

The teams taking part in Your Extreme 2021 are to choose one of the assignments below linked to technology and the oceans:

1. Based on subsea technology, propose a technology or concept that in a sustainable manner solves a challenge relating to ocean management and the harvesting of biological resources and minerals in the ocean, the transport of goods or people, or the development of sustainable offshore energy resources.
2. Based on inspiration from the film “Nordsjøen”, in which subsea robot Eelume plays one of the leading roles, propose a radical solution in which one technology (or more than one) resolves a critical situation at sea where human life must be protected. The situation may take place above and/or below the surface of the ocean.

Criteria for the assignment:

- The solution must be realistic in a 10-20-year perspective, which is the horizon for some of KONGSBERG’s early development projects.
- The assignment must shed light on any problems linked to the interaction between humans and machines.
- The assignment should describe how the Norwegian “tripartite collaboration” between research/academic environments, industry and customers is to contribute.
- The solution is to be based on sustainability as a fundamental assumption.
- The solution must shed light on the cooperation between people and machines/unmanned vessels.

It is important to approach the problem from a multidisciplinary perspective in which the technology, concept and major social considerations and needs are both described and resolved.