However, there are several drawbacks to AI technology. Including high costs and susceptibility to cyberattacks. But AI's benefits outweigh these drawbacks.

References:

1. https://www.siemens.com/global/en/company/stories/industry/ai-in industries.html
2. https://emeritus.org/blog/examples-of-artificial-intelligence-ai/
3. https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/the-future-is-now-unlocking-the-promise-of-ai-in-industrials

MODERN ACHIEVEMENTS OF DESALINATION

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Desalination is the process of removing salt and other minerals from seawater or brackish water to make it suitable for human consumption or industrial use. The need for desalination has increased in recent years due to several factors (Giwa et al. 2016), including:

- Water scarcity: Many regions around the world are facing severe water scarcity due to droughts, climate change, and overuse of existing water sources. Desalination provides an alternative source of fresh water that is not dependent on rainfall or surface water.
- Population growth: The world's population is growing rapidly, and with it, the demand for water is increasing. Desalination can help meet this growing demand for water.
- Industrial demand: Many industries, such as power generation, oil and gas, and mining, require large amounts of water for their operations. Desalination can provide a reliable and consistent source of water for these industries.
- Coastal communities: Many coastal communities around the world rely on desalination for their drinking water supply. This is particularly important in areas where freshwater sources are limited or contaminated.
- Despite its benefits, desalination also has some drawbacks, including high energy requirements, high capital costs, and potential environmental impacts. However, as the need for fresh water continues to grow, desalination is likely to play an increasingly important role in meeting this demand.

There are many studies on desalination plants aimed at increasing efficiency and energy conservation of the facilities.

In study Xiaoxin et al. (2009), a new method of water desalination using microbial desalination cells (MDCs) was proposed. The study demonstrates proof of concept for the MDC process by modifying a small laboratory-scale reactor originally designed to function as a microbial fuel cell. Using these MDCs, it was shown that approximately 90% salt removal can be achieved in a single desalination cycle while also producing a useful amount of electrical energy.

The efficiency of the spray tower is low due to the low water-holding capacity of the humidification block, and therefore, there are numerous studies aimed at addressing this drawback. For example, in study Nematollahi et al. (2013), a packing material (packing layer) is introduced into the humidification block, which increases the water-holding capacity of the humidifier and hence the specific humidity of the air. The results of the study showed that exergy efficiency increases with decreasing tower length. And in study Nawayseh et al. (1997), it was concluded that to achieve the best results, the correct choice of humidifier, dehumidifier, and nutrient water flow rate is necessary.

In a bubble column humidifier, water is filled into the vessel, and air is injected through several holes submerged in the water layer. This way, water diffuses into the air bubbles, and the output air is humidified. The humidification performance of the bubble column humidifier depends on gas content, bubble velocity, bubble diameter, water and air temperature, as well as heat and mass transfer coefficients (El-Agouz et al. 2008). In the study El-Agouz et al. (2010), the application of a bubble column humidifier for water humidification showed that the installation produces 8.22 kg/h of fresh water.

In article Soteris (2005), a review of various renewable energy desalination systems is presented. Among several possible combinations of desalination and renewable energy technologies, some seem more promising in terms of economic and technological feasibility than others. However, their application heavily depends on the local availability of renewable energy sources and the quality of the water being desalinated. Additionally, some combinations are better suited for large-scale installations, while others are more appropriate for small-scale installations.

The most popular combination of technologies is thermocollectors and reverse osmosis. This technology is suitable for small-scale applications in sunny areas. For large installations, wind energy may be more attractive as it does not require much land. This is often the case on islands where there is a good wind regime and often very limited flat terrain.

The world’s water demands are rapidly increasing. Wind, solar, and other renewable energy sources that can be used for desalination are a promising solution from an economic and ecological standpoint. And new designs of desalination plants and methods are improving the efficiency and cost-effectiveness of these systems.

References:

1. Giwa A., Akther N., Al H.A., Haris S., Hasan S.W. Recent advances in humidification dehumidifiation (HDH) desalination processes: improved designs and productivity. Renew Sust Energ Rev. 2016; 57: 929-944.
2. Xiaoxin Ca, Xia Huang, Peng liang, Kang Xiao, Yingjun Zhou, Xiaoyuan Zhang, Bruce E. Logan. A new method for water desalination using microbial desalination cells. Environ. Sci. Technol. 2009; 43: 7148-7152.
3. Nematollahi F., Rahimi A., Gheinani T.T. Experimental and theoretical energy and exergy analysis for a solar desalination system. Desalination 2013; 317: 23-31.
4. Nawayseh N.K., Farld M.M., Omar A.A., Al-Hallaj S.M., Tamimi A.R. A simulation study to improve the performance of a solar humidification-dehumidification desalination unit constructed in Jordan. Desalination 1997; 109: 277-84.
5. El-Agouz S.A., Abugderah M. Experimental analysis of humidification process by air passing through seawater. Energy Convers Manag 2008; 49: 3698-3703.
6. El-Agouz S.A. A new process of desalination by air passing through seawater based on humidification-dehumidification process. Energy 2010; 35: 5108-5114.
7. Soteris A. Kalogirou. Seawater desalination using renewable energy sources. Progress in Energy and Combustion Science 2005; 31: 242-281.

DEPENDENCE OF THE STRESSED AND DEFORMED STATE OF CONCRETE ON TEMPERATURE INFLUENCE IN EUROCODE 2

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Temperature effects did not have a significant influence on the multi-story buildings constructed some years ago, since with a large mass of external and internal structures and with practically constant internal temperatures, the problem of the difference in the elongation of the elements did not arise. The situation has become more complicated for modern multi-story buildings with statically uncertain structures of significant dimensions. In modern construction, load-bearing structures, frame elements, structures of the external enclosure of buildings usually have significant dimensions, and, at the same time, engineers use a variety of non-standard project solutions. As a result, there is a need to take temperature effects into account. When designing buildings in modern construction and, first of all, taking into account the hostilities that are ongoing in Ukraine, it is necessary to take into account climatic and operational thermal effects, which must be neutralized by insulating the sources of heat release and/or insulating adjacent structures.

The temperature difference depends on the functional purpose of the building, its location, orientation in relation to the region, internal temperature regime, surface and equipment of enclosing and supporting structures. But the most vulnerable to temperature effects are the structures used directly during the construction of buildings. These structures are exposed to changes in air