Augmented Reality (AR) and Its Uses in Engineering

By: Nourin Abd El Hadi (216107021)

AR and Engineering

As technology advances, problems we never knew we had are slowly getting solved. The ability to look at an engine or a circuit and be able to access technical documentation in an instant is now possible. Many disciplines such as aerospace and industrial are beginning to take notice of the usefulness of using AR, as Figure (a) [1] shows below. There are different ways to apply AR into engineers' workdays (Figure (b)) [1] such as tablet and, the most popular, head mounted. The technology surrounding augmented reality has improved to the point where the the headsets are mobile enough to be used throughout different industries.

Figure (c)

Figure (d)

Limitations

Though augmented reality solutions and technologies have improved greatly over the past few years, there are still some limitations that do not allow us to use augmented reality to its full potential. One limitation is its portability. At the moment, head mounted AR headsets are very bulky, heavy and need to be connected to a computer to function best. Future research should focus on creating a more accessible and portable way to use AR. Another issue with using AR is calibration as it still delays or skews, which could lead to fatal errors in the system. Setting up and programming a system that is compatible is very time consuming and causes delays, making it another issue for AR. Augmented reality is also unreliable in the outdoors as the lighting would skew the images and the scans.
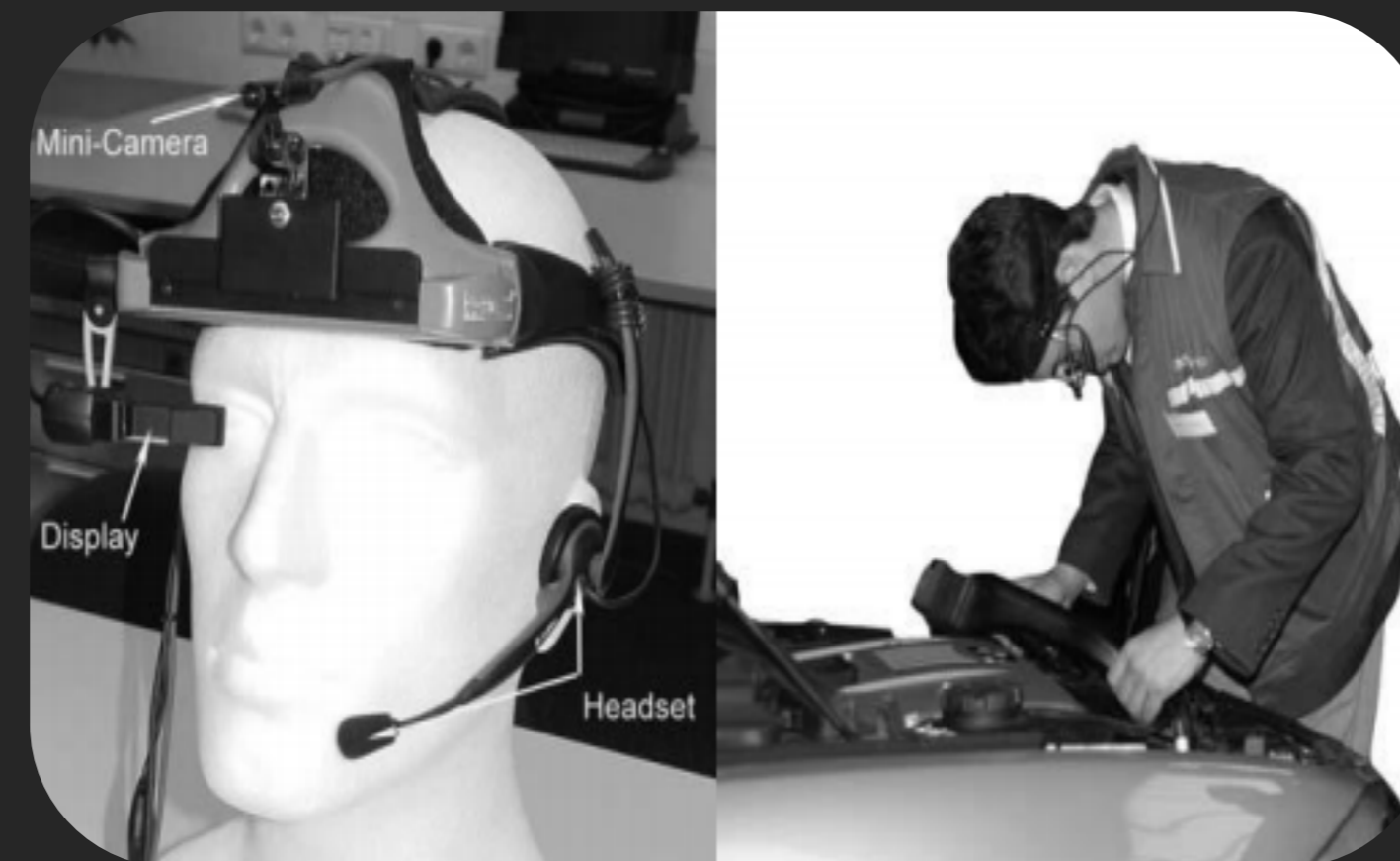
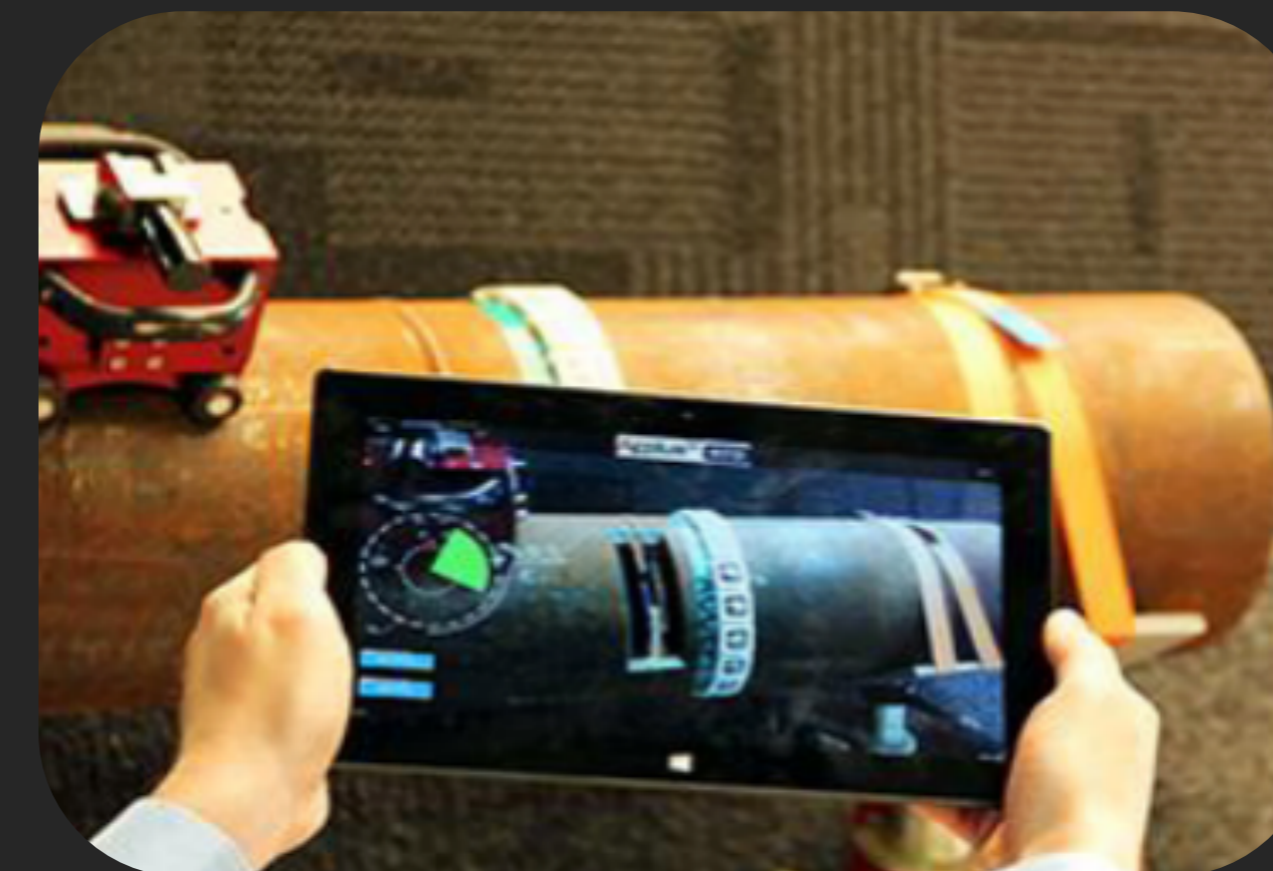## Applications

There are many ways that AR can be useful in the workplace. One of the most common ways that AR is used can be found in some sort of maintenance, repairing tasks and during inspection [1] using the overlay methods to scan and understand the problem. Being able to immediately pinpoint the problem is very advantageous during those tasks as it decreases the time required to solve the issue. Figure (c) shows an example of a head mounted AR system and a person repairing a car and Figure (d) shows an example of augmented reality in maintenance situations. A more detailed example is that AR solutions have been used in different aircrafts to try and minimize the amount of human error that can occur, in turn saving time and money as well as ensuring the safety of the passengers.
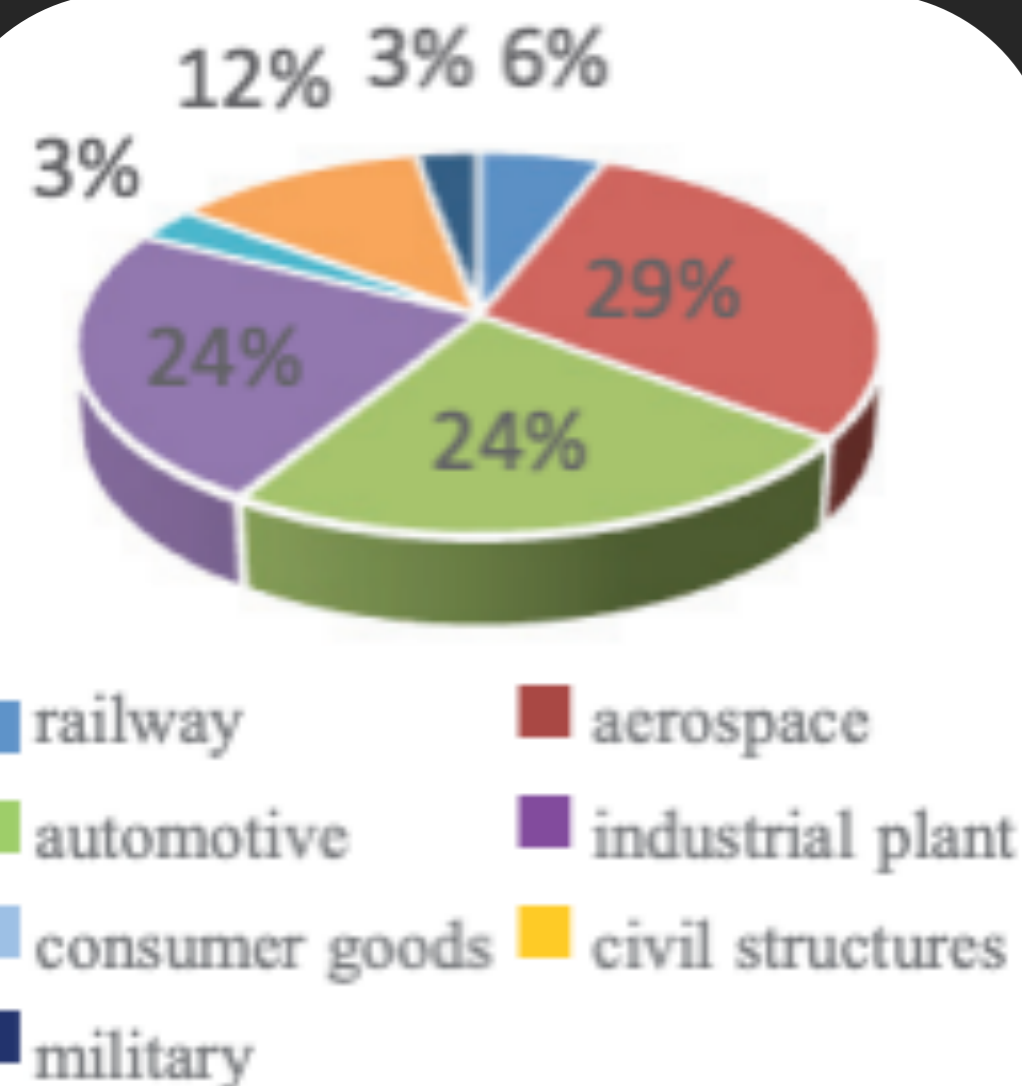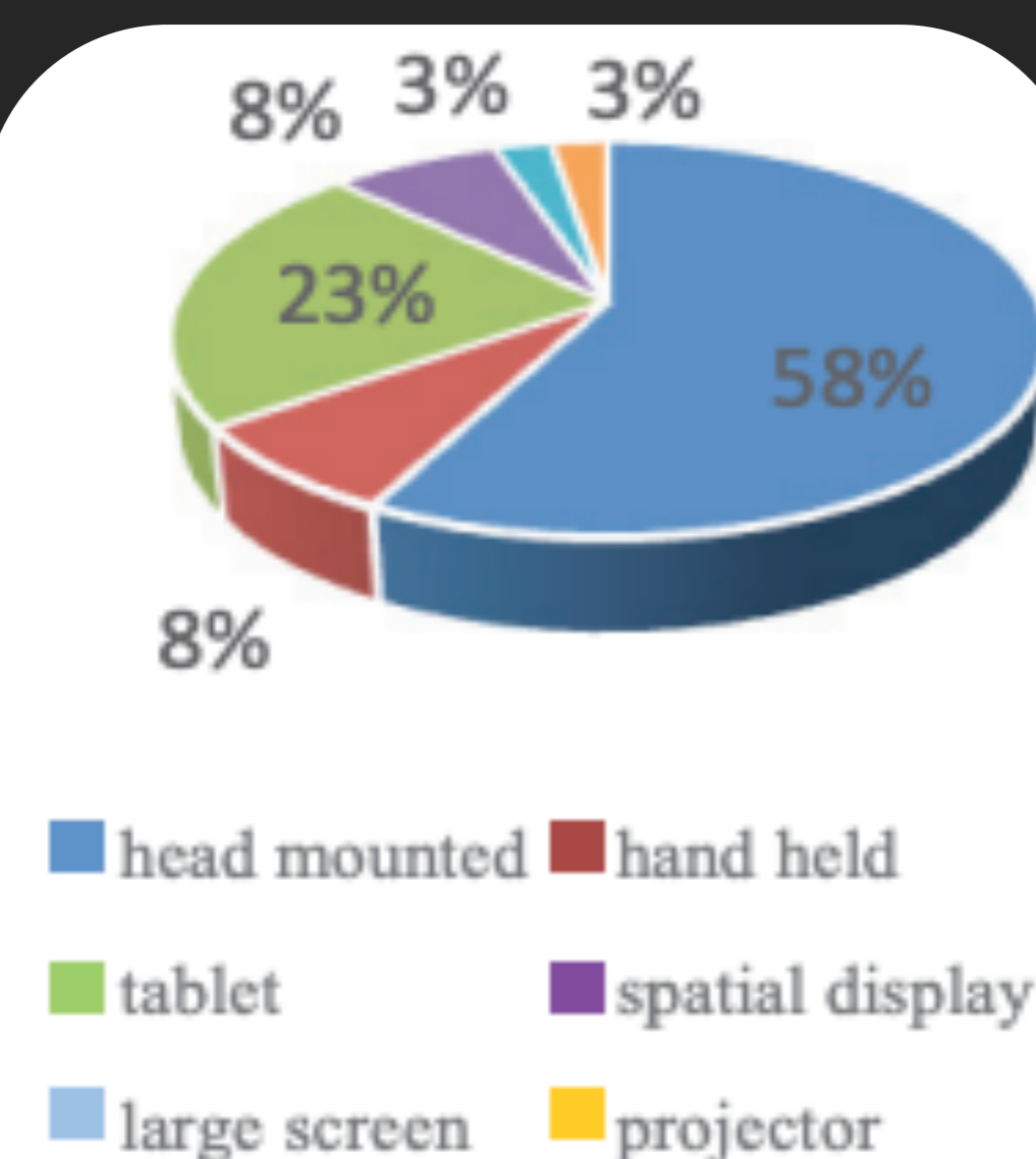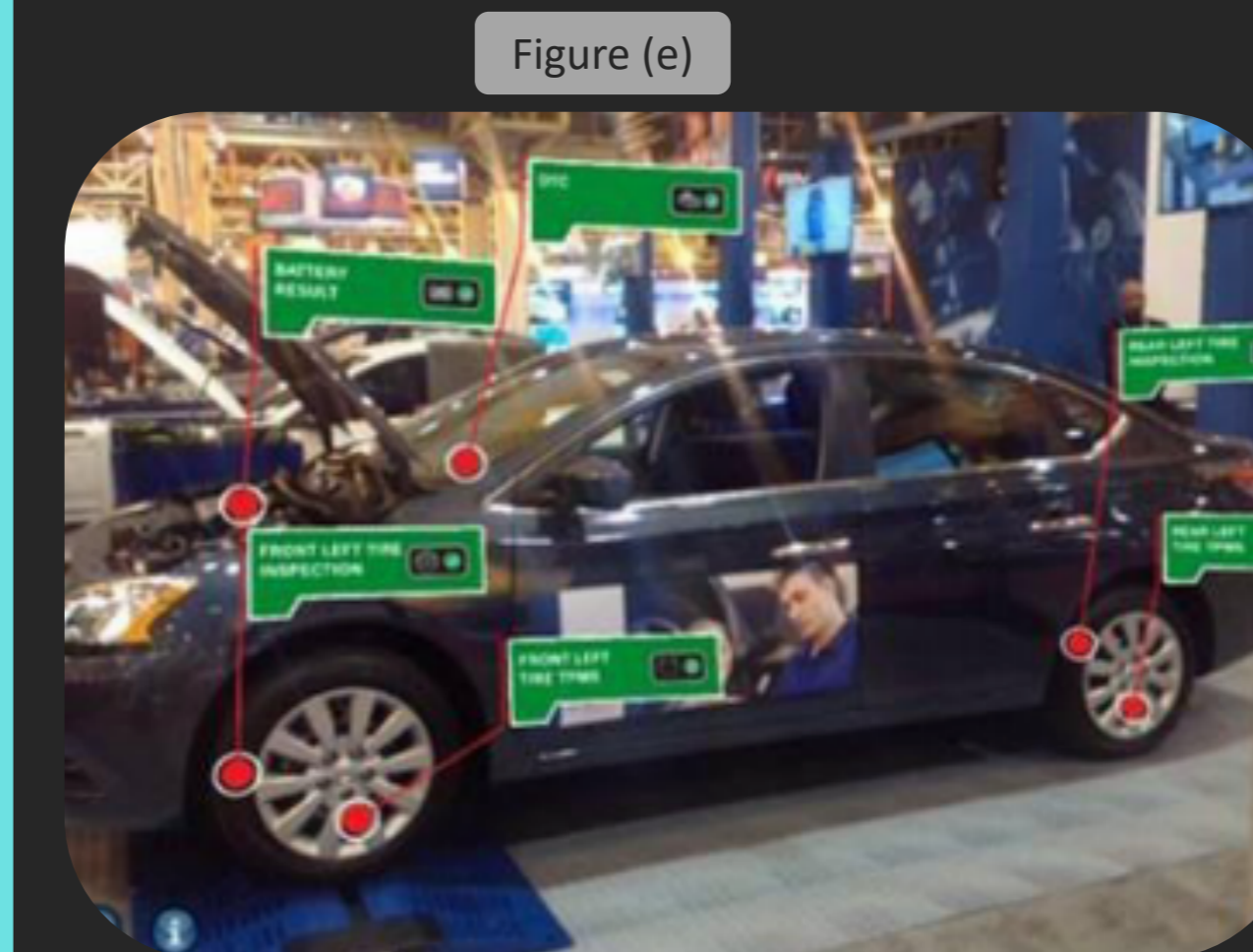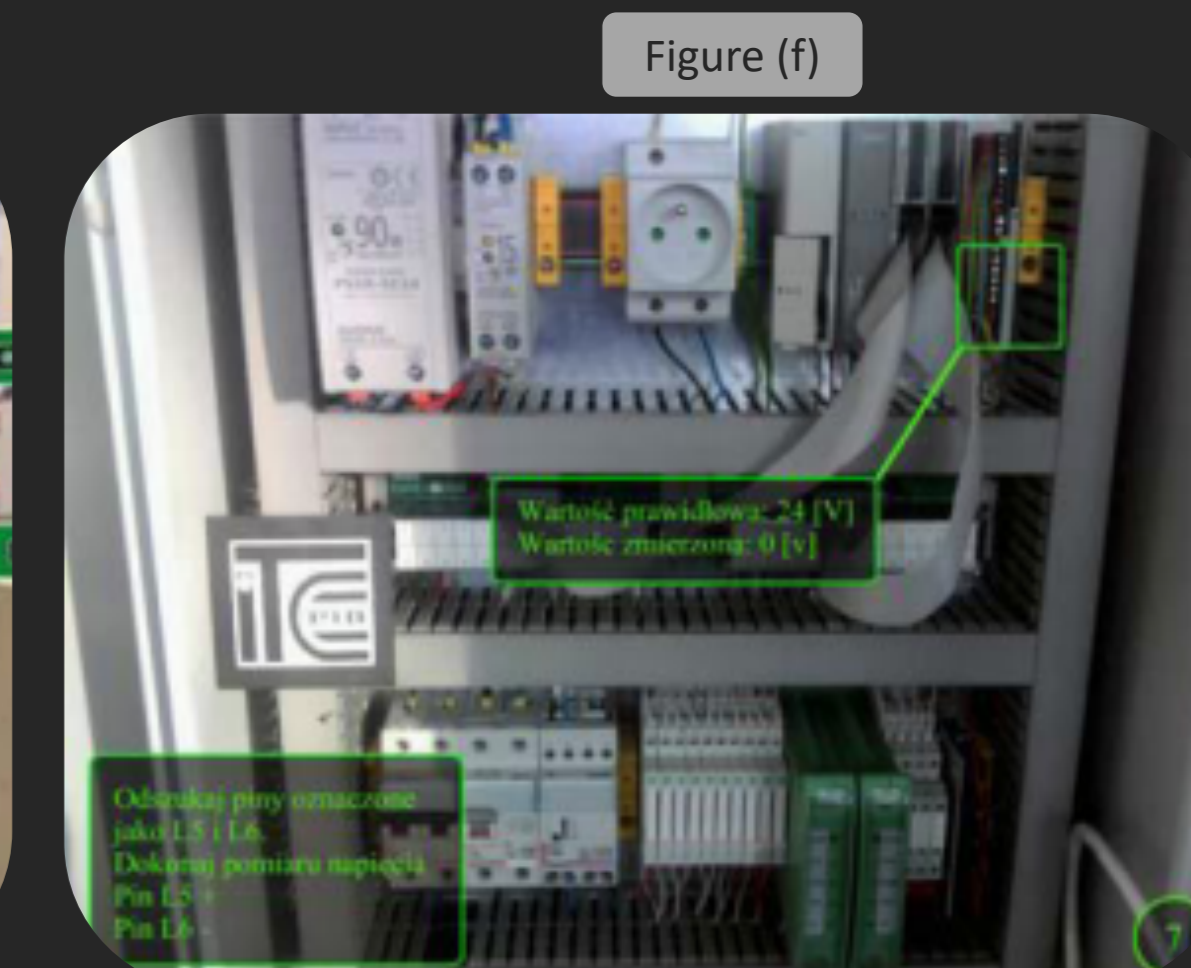

Figure (a)

Figure (b)

Figure (e)

Figure (f)

[1] G. Dini and M. D. Mura, "Application of Augmented Reality Techniques in Through-life Engineering Services," Procedia CIRP, vol. 38, pp. 14–23, 2015.