Abstract
Tasked with creating a design fiction of my own, I have written this paper which reveals a concept that will aid in keeping cities and towns cleaner. I present the idea of a fleet of drones which will be both in the air and in the rivers of the cities and towns, which will be able to identify solid waste on the ground or in rivers and pick them up to deliver them to an appropriate disposal centres. The idea came from the observation of many people discarding their litter on the streets and in the rivers of cities and towns where a bin was not in the person’s immediate area. This paper reveals how the papers I have researched have influenced this idea and the hopes of a cleaner environment in the future which is critical for the survival of all life.

Introduction
In researching this subject, we realised how much solid waste is dropped in cities and towns instead of put into the correct rubbish bins and how poor management can affect the environment. Litter pollution is a major cause of climate change and it has been affecting wildlife and nature for years, not to mention the effect it has had and continues to have on our own well-being. With all of this in mind, we thought of the concept of drones that clean up discarded solid waste and we hope that within the next 10-15 years we will be en route to reversing climate change.
Researching Human - Robot Relationships

In my research of the relationships between humans and robots or devices it is clear that there is a fine line between what can make a person feel comfortable or make them feel uncomfortable towards the technology. If you go too close to the uncanny-valley I think it is unlikely people will warm to your product. With the design fiction concept of the fleet of cleaning drones I think it was important to find out what people would react best to in the real world as the concept involves the drones becoming a part of everyday normality to the towns and cities, they would be implemented in. In the research [1] it was found that anthropomorphic and zoomorphic designs resulted in greater engagement and trust while neutral or less visible designs created rejection and anxiety. This was a key part of the research as it gives insight into how the drones of our design fiction should be physically designed.

It would be important that people have a good perception of these drones because negative feelings and attitudes could result in damage or vandalism of the drones. It is my opinion that the relationship between the community and the drones be positive and hopefully the drones could encourage communities to be cleaner and litter less. In my research of [2] the paper aimed to understand how communities can be empowered to identify and respond to issues in their local area themselves, rather than simply acting as recipients of civic technologies. If the drones could encourage people to litter less and be cleaner this would be ideal as the main goal of this design fiction is to reduce litter in towns and cities.

Effects of Litter Pollution on the Environment

It is a known fact that global warming and climate change are a huge problem in today’s society. In the research statistics show that [3] waste management must be improved by 85% in the top 35% countries of mismanaged plastic waste to achieve a 75% reduction. Our future is looking very grim if we do not start making more change in the way we deal with the management of waste. Litter pollutes our forests, our oceans, our rivers, our streets; anywhere humans exist there is litter pollution. Even out in the middle of the ocean plastic persists. The concept needs to include not only the drones that clean up solid waste on land but the water drones too that can clean rivers and the sea and the ocean and lakes.

While coming up with this design fiction, we had the environment and the affect climate change is having on the world strongly in mind. Litter pollution is a huge
contributor to climate change. Climate change affects so much of our own lives because of the affects it has on nature and wildlife. We need nature and wildlife to sustain ourselves and for our well-being and our survival. With all the pollution from litter we are seeing sea levels rise, and extreme weather changes. These changes in weather are difficult for wildlife to adapt to and with a failure to adapt we are seeing a decline in so many species and even extinction for many. Rising sea levels result in loss of land space for us and even loss of habitats for some wildlife.

**Figure 2.** Sketch of water drone

[4] Municipal solid waste management (MSWM) is a major problem in Indian cities and as various different studies have revealed, the solid waste that is collected is unscientifically disposed of 90% of the time. This causes environmental problems as well as problems to human health. The population density affects the amount of pollution there is and the composition of municipal solid waste (MSW). With the population of the world becoming bigger with every year that passes, so too is the amount of pollution created each year. Because of this, it is important to manage waste efficiently and in an environmentally friendly way, but to do this we must first have a way of disposing of waste in an environmentally friendly way that is also efficient; here enters the concept of the drones.

The drones we propose would run on renewable energy - for instance solar power – and so they would be more environmentally friendly and sustainable than the current method of cleaning up solid waste – rubbish trucks. This means they would cause less pollution than cars and trucks do and have a better effect on the environment. Litter pollution has a bad effect on the environment, especially when there is so much of it. With these drones, we could reduce the amount of litter on town and city streets and in the rivers of towns and cities, and by doing so reduce the harmful effects litter pollution has on the environment.
References


