

# Upsurge of Artificial Intelligence to Combat Ocean Plastic Pollution

**Dr. A. Sankaran**

Course In-charge, Department of Marine Engineering  
Mohamed Sathak Engineering College, Kilakarai, India

**Abstract:** *Plastic is a peerless Knotty material cleaved around lingering than other forms of detritus. Around 80 percent of marine plastic waste actually originates from terra firma. These are relocated to rivers from streets during hefty rain via storm drains and sewer overflows. Best thing is to fortify waterways and try to keep as much as of the plastic away from the waste stream. In this paper we confer about the methods to combat ocean plastic pollution and aggrandizement of Artificial intelligence to learn and solve problems concomitant to malleable material.*

**Keywords:** Trash bot, Bin e-trash, Oscar's AI, Microsoft AI for Earth grant, Drones

## I. INTRODUCTION

Aquatic (Fauna and Flora) is impacted by plastic pollution through entanglement, guzzle and changes to the integrity and functioning of habitats. Macro debris is through entanglement and micro debris through guzzled to a wide range of marine species. The nemesis and electrification of malleable marine debris is governed by poorly understood geophysical processes such as ocean mixing with the surface boundary layer. Improper ejection of municipal waste water discharge, sludge dumping ground and plastic mulch from agricultural activities is of serious regarding soil pollution. 10 million tons of plastic enter the ocean annually.

Marine plastic pollution has documented impacts on marine organisms and ecosystem services. The use of chemical flavour enhancer in plastics poses a prospective threat to human health. The recycling is contrived by material and chemical complexity. An ecosystem impact paves way for the analysis of medium to high frequency of malleable material and medium to high degree of irremediable. Plastic pollution is now a worldwide outwardness that damages ecosystem, retrench biodiversity and potential to affect anyone on the planet. Misgovern of plastic waste is a huge vicissitude of the populace in our oceans, seas and waterways. By the end of 1980's most exert influence of marine litter were reasonably well understood and heed shifter to seek efficacious solutions to outfit marine litter problems. Increasing production of plastic combined with waste disposal enactment of marine litter, safeguard and execs has become a important political and societal issues.

Contemplation exists not only on plastic promulgation but also rely on proper waste management sensitivity and awareness of people. The Environmental culmination of plastic solid waste is visible in the ever increasing level of global plastic pollution both on land and in Oceans. Chemical recycling technology will lower energy requirement that is compatibilization of mixed plastic waste to avoid need for sorting and expanding recycling technologies. Ocean currents tend to intervene and domestic sources connect sampled sites. The use of plastics is ubiquitous. In order to tackle this one must require adequate metrics to guide and itemize action at different levels ranging from sound product design and efficient regional infrastructure to adequate policies and enforcement. Artificial intelligence and Scientific methods examine astounding advancement to combat ocean plastic pollution.

The stalking of getting the complex integration on Environmental quality leads to developing new methods and analytical techniques. Artificial Intelligence in 21st century introducing languages of thought, metacognition, economic prospects and research towards human level AI. Self driving cars, drones and home robots are burgeon and advancing rapidly. AI is now part of our everyday life and its invasion is expected to intensify.

**II. METHODS TO COMBAT PLASTIC POLLUTION**

**Reduce your use of single use plastics:** The most committed action is to bring down your own use of single use plastics(fig-1-Example of single use plastics).single use plastics include plastic bags, water bottles straws, cups, utensils, dry cleaning bags. These items are used once and thrown away. Refuse single use plastic items and carry with you reusable version of those products. This would enable them to know that you would like them to offer alternative

**Recycle properly:** The process of recovering scrap or waste plastic products and reprocessing in to useful product is known as recycling.8 million metric tons of plastic waste enter the ocean every year. Efforts are being taken globally to reduce the plastic waste entering water stream. Process involves collect, sort, shred, clean, melt and making of pellets. Recycled plastic (fig2-Example of recycled plastic) encourages sustainable source of raw materials, reduces environmental protection and reduces landfill problems. Plastics are being shaped in to different forms like homes made of plastic bottles, converting plastics in to oil, 3DPrintingtechnology, Roads.

**Participate in a Beach or River clean up:** Organize seminar and workshop Events (fig 3- Example of Seminar Event) for cleanup operations. This will kindle in the minds of people to keep our environment clean and make it sustainable for future generations to meet their needs. Participate in the events organised locally by coast guard authorities or pollution control board with your friends or family.

**Support ban:** Many governments around the world ratify ban on single use plastics.(Fig 4 Example of supporting ban in local community) Adopt policies in the community will rejuvenate to fight against plastic pollution.

**Avoid products containing micro beads:** Tiny plastic particles (fig 5 Example of products containing micro beads) less than 5mm are used in many cosmetic products, cleaning products and personal care. These micro beads are the huge source of oceanic plastic pollution in recent years.

**Support organization addressing plastic pollution:** There are many non-profit organizations like Green peace, clear blue sea, algalita, Friends of the earth are taking huge efforts to reduce plastic pollution. Organizations depend on donations to continue their important work.



Fig-1-Example of single use plastic



Fig 2-Example of recycled plastic



Fig 3-Example of Seminar Event



Fig 4- Example of supporting ban in local community



Fig 5 Example of products containing micro beads

### III. ARTIFICIAL INTELLIGENCE TO CONFRONT PLASTIC POLLUTION

**Microsoft AI grant** for Earth program awards grant to prop-up projects that hard cash the way people and organizations monitor, model and primarily be in charge of Earth's natural system. Depending on the need of the project, the grant can award Microsoft azure cloud computing resources(Including AI tools and data labelling services).Mechanization plays a scathing role in ensuring the plastic data collected by citizen scientist are being conceded as credible and usable to inform decision-making worldwide. Microsoft AI for Earth grant put us in close proximity to take this innovative program to the world.

**Artificial Intelligence built in to Google app** will lend a helping hand to the waste workers and the public to footpath the amount and type of waste they collect. This helps them to stockpile time by propounding more systematized route and appraises their earning potential. In Indonesia they could improve their recycling rates by 35 percent in first village of target Sanurkaja in Bali.

**Oscar's AI system** leverages computer vision and machine learning to emancipate a zero waste world. Oscar managed to have huge enormous social impact by poking users to separate squander items at the point of disposal. This type of separation is highly important in exorbitant traffic flow areas such as airports, malls, universities etc. waste disposal is done at a rapid pace. Scar will refurbish in real time and educate the public pertaining to their municipalities' latest recycling guidelines with a reconstruct module that is easily attached to any existing waste bins. Oscar can be as zestful as possible. Data quality is just important as data expanse. The AI system is trained with thousands of images of waste items held by users in every possible way.

**Trashbot** is a Robotic trash embedded with AI. Someone throws an object into the bins, the system will tack the power of sensors and machine learning to identify the type of object. It will also weigh it, drain any liquids and place it on the respective bins providing 90% accuracy. Clean Robotics is planning to modify Trashbot by adding LED'S to the system. This will make people acquainted with information that the malleable items they throw away is recyclable.

**Bin-e-trash** is furnished with cameras and sensors and relies on machine learning to perceive and identify the waste hurl in it. After if confess the object, it will direct the item in to the right chamber. When the chambers are full, it will apprise the perpetuation team to take the trash to recyclingplant. When someone throws an item in to the bin there is an automatic upload of Marque and quantum of items to the cloud

**Samur AI** is a Robotic innovation burgeoned by machinex to identify the object. This system uses suction cup to pick it up and place it on the correct bin. Sorting robot can perform 70 picks per minute when compared to human execution of 35 picks. Samur AI provides environmentally responsible waste and recycling solutions.

**Drone-mounted cameras** are positioned above the sea floor to take thousands of aerial photos. The photos captured by the cameras are then cast-off to train an AI algorithm to concede images of plastic trash. Algorithm developed will highlight the difference between shells, jellyfish and malleable materials. The images will make clean up organization to organise clean up events in the worst-impacted areas for humans, marine life and bird life.

#### **IV. CONCLUSION**

Artificial Intelligence influenced techniques to fight against plastic pollution will make a change to the ocean environment. The litter which drives away to reach the water stream are being stopped, sorted in a quick span of time and scheduled for recycling. This AI initiative will pave way for expeditious production of recycled malleable products in the market. Demand for recycled malleable material will increase in the market.

#### **REFERENCES**

- [1] Nicola j Beaumont, margretheganesan, Melanie Austen: Global ecological, social and economic impacts of Marine pollution bulletin 142,189-195(2019)
- [2] Stuart j Barnes: Understanding plastic pollution the role of economic development and technological research.Environmentalpollution 249, 812-821(2019)
- [3] Bethanie Carney almroth, Hakan egests: Marine plastic pollution sources, impacts and policy issues. Review of environmental economics and policy, 2019
- [4] Julienne Boucher, Guillaume billard: Challenges of measuring plastic pollution, Journal of field actions, 2019
- [5] Philip c. Jackson: Introduction to Artificial intelligence, Courier dower publications, 2019
- [6] Yooeunchae, youn-jooan: Current Research trends on plastic pollution and ecological impacts on the social ecosystem. Environmental pollution 240, 387-395, 2018.
- [7] Loris Piet reth, sandropignatti, Maria Cristiana fossi, Rendicontilineci: Foreword- Plastic pollution a short and impressive story, Fische e Naturati 29(4), 803-804, 2018
- [8] Keng Sian, Weiyu Wang: Building trust in artificial intelligence, machine learning and robotics Culter business technology journal 37(2), 47-53, 2018
- [9] Jeannette M.garcia, Megan l Robertson: The future of plastic recycling, Science 358(6365), 870- 872, 2017
- [10] Peter g.ryan: A brief history of Marine litter research, Marine anthropogenic litter, 1-25, 2015
- [11] A.C.vegter, M.Baolette, C.Beck, and J.Borrero: Global research priorities to mitigate plastic pollution impacts on marine wildlife, endangered species research 25(3), 225-247, 2014
- [12] Julia Reisser, Jeremy haw, Chris Wilcox, Britta Denise Hardesty: Marine plastic pollution in waters around Australia: characteristics, concentration and pathways, Plos one 8(4), e80466, 2013
- [13] T.Kukulka, G.Proskurowski: The effect of wind mixing on the vertical distribution of buoyant plastic debris, Geophysical research letters 39(7), 2012
- [14] Jack namiesnik: Modern trends in the monitoring and analysis of Environmental pollution, 2001
- [15] Donald Gilles: Artificial Intelligence and scientific method, oxford university press, 1998.