1. **INTRODUCTION**
   1. **LOCOMOTION FOR ROUGH TERRAIN**

The advance in miniaturization technologies have gave rise to new developments in small mobile robotics platforms along with the need for these to operate in unstructured environments with highly uneven terrains. These robots are mainly used for tasks which reduce human activity in hazardous tasks such as in explosive ordinance disposal, in military operations, in nuclear material handling, in highly polluted areas which are not accessible to humans due to intoxication and in urban search and rescue, such as, in the debris of buildings after an earthquake where humans cannot pass. But the application that has received the most media attention in recent years is planetary exploration. Human space missions to Mars are not possible at the moment, therefore, mobile robots are employed to explore the Red Planet and return data to Earth.

These applications made the robot an intermediary that primarily gathers information for human operators or provides mobility to scientiﬁc instruments to approach targets of interest. To accomplish these tasks successfully, the robots have to have means to adapt to uneven terrain and climb over obstacles, this means, their need increased mobility capabilities.

* 1. **ADDITIVE MANUFACTURING (3D PRINTING)**

As the developments in robotics are proliferating, a novel manufacturing technique has, in recent years, caught public interest and has increased in adaptation. It is 3D printing. The use of 3D printers has grown rapidly and Scientists and Engineers across the globe are finding new ways to use this technology and push the corners of manufacturing industry.

3D printing is also termed as Additive Manufacturing. It is applied in manufacturing foods, medicines and even organic parts which can be attached to human bodies (Bio-Printing). It has cut the costs of Rapid Prototyping (another manufacturing technique) in half. It has solved the difficulties in producing intricate seamless designs. But most importantly, it has boosted the trend of DIY products.

3D printers made it easy for a common citizen to make his own products as 3D printers are versatile and easy to use. Many companies are focusing on this trend to help users make their own products. The company will design 3D CAD models of their product. If an order is placed for their product, instead of shipping the whole product, they send parts like screws, chains, batteries etc. and asks the user to 3D print the body. This decreases the production cost for the company and also the purchase cost for the end user. It also motivates open sourcing of several public domain products, so that everyone would have ability and means to make their own product, eliminating the need for industries.