\documentclass{article}

\usepackage[utf8]{inputenc}

\usepackage{graphicx}

\usepackage{float}

\usepackage{fancyhdr}

\pagestyle{fancy}

\fancyhf{}

\rhead{\thepage}

\cfoot{15 APRIL 2018}

\begin{document}

\title{{\Huge TECHNICAL REPORT\\ ON \\ SPACE ROBOTICS}}

\author{{\LARGE CHETNA GUPTA\\16103040}}

\date{}

\maketitle

\begin{figure}[H]

\centering

\includegraphics[scale=0.5]{pec\_seal.png}

\end{figure}

\centering

\begin{large}

PUNJAB ENGINEERING COLLEGE

\end{large}

\centering

\date{15 April 2018}

\pagebreak

\tableofcontents

\pagebreak

\section{Introduction}

The space exploration has always been a suicidal mission for astronauts.The first Satellite was launched on October 4,1957 making Russian Lt. Yuri Gagarin the first human to orbit Earth.The advancements in the space research has led the robotic missions to reach space faster and gather more information than humans.The space technology is extensively developing with every passing year.Now astronauts can spend as long as 1 year in space. NASA is trying to reduce the human effort in space by deploying space robots who can extensively assist astronauts in various tasks.\\

`Space robotics is the development of general purpose machines that are capable of surviving (for a time, at least) the rigors of the space environment, and performing exploration, assembly, construction, maintenance, servicing or other tasks in space.`

Robots can perform tasks less expensively and with improved performance over humans doing the same task.They can survive in extreme environmental conditions of space and can be sent to places which are otherwise inaccessible by humans.Robots don't get bored or distracted thus making them more effective and useful than humans.Moreover in many space missions,the cost of returning back to space is very huge.So,by using these robots that cost can also be reduced.Robots require less infrastructure and less safety requirements thus making them more useful in space exploration industry.\\

\section{How Robots work in Space?}

Robots work in space according to the SPA Algorithm.SPA stands for Sense,Plan and Action.\\

SENSE: A robot must be able to sense its surroundings about important things like the presence of obstacles and navigation aids.This is done through several sensors attached to the robot body like thermal,light,sound,chemical,force proximity,resistance etc.\\

PLAN:The robots needs to examine the sensed data and respond appropriately to it based on pre-planned strategy and knowledge.\\

ACT: Finally, the robot must actually act to carry out the actions that the plan calls for.e.g. move arms and legs, speech text, operate etc.

\section{Recent Missions}

\subsection{The MARS Exploration Rover}

\subsection{Dextre}

\subsection{Robonaut}

\section{Disadvantages of using robots}

\section{Conclusion}

\end{document}