Report Title

Course Code - Course Name

I verify that the contents of this report are my own work

Firstname Lastname
zID
Date Month Year

Contents

1 Introduction

2 First section

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5 Conclusion

References

[1] J Doe. *Laboratory Handout1*. University of New South Wales, Lab Handout, Sydney, Year.

[2] J Doe. *Laboratory Handout2*. University of New South Wales, Lab Handout, Sydney, Year.

Refer to this document for IEEE citing guidelines.

A Basics

A.1 Basic notations

```
\textbf{I am Bold}.
\textit{I am Italic}.
```

I am Bold.
I am Italic.

A.2 Bullet points

A.2.1 enumerate

```
\begin{enumerate}
    \item Use this to create your very own latex notes.
    \item Make sure you have installed necessary latex stuff.
    \item Have a fun journey!
\end{enumerate}
```

1. Use this to create your very own latex notes.
2. Make sure you have installed necessary latex stuff.
3. Have a fun journey!

A.2.2 itemize

```
\begin{itemize}
    \item To bullet,
    \item Or not to bullet.
\end{itemize}
```

- To bullet,
- Or not to bullet.

B Equations

B.1 Types

B.1.1 equation

```
\begin{equation*}
    F = ma
\end{equation*}
```

$$F = ma$$

B.1.2 align

```
\begin{align*}
    F    &= ma \\
         &= 3\times5 \\
         &= 15\ [N]
\end{align*}
```

$$\begin{aligned} F &= ma \\ &= 3 \times 5 \\ &= 15\ [N] \end{aligned}$$

B.1.3 gather

```
\begin{gather*}
    F    = ma \\
       x = y+z \\
       z = x-y
\end{gather*}
```

$$\begin{gathered} F = ma \\ = 3 \times 5 \\ = 15\ [N] \end{gathered}$$

B.1.4 Numbering

```
\begin{equation}
    F = ma
\end{equation}

\begin{align}
    F    &= ma \nonumber \\
         &= 3\times5 \nonumber \\
         &= 15\ [N]
\end{align}

\begin{gather}
    F    = ma \\
        x = y+z \\
        z = x-y
\end{gather}
```

$$F = ma \tag{1}$$

$$\begin{aligned} F &= ma \\ &= 3 \times 5 \\ &= 15\ [N] \end{aligned} \tag{2}$$

$$F = ma \tag{3}$$

$$x = y + z \tag{4}$$

$$z = x - y \tag{5}$$

B.2 Fraction

```
\begin{equation}
    \frac{x}{2}+\frac{y}{2}=z
\end{equation}
```

$$\frac{x}{2} + \frac{y}{2} = z \tag{6}$$

B.3 Matrices

```
\begin{gather*}
    R = \begin{bmatrix}
        0& 0& 0 \\
        0& 0& 0 \\
        0& 0& 0
    \end{bmatrix}
\end{gather*}
```

$$R = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

B.4 Notations

B.4.1 Cancel

```
\begin{equation*}
    \bcancel{2}\frac{x}{\bcancel{2}}+\frac{\cancel{2y}}{\cancel{2y}}=x
\end{equation*}
```

$$\bcancel{2}\frac{x}{\bcancel{2}}+\frac{\cancel{2y}}{\cancel{2y}}=x$$

B.4.2 Colour

```
\begin{equation*}
    2\textcolor{red}{\cancel{\textcolor{black}{x}}} (z+y)
    = 5\cancel{\textcolor{red}{x}}
\end{equation*}
```

$$2\cancel{x}(z+y) = 5\cancel{x}$$

B.4.3 Braces

```
\begin{equation*}
    d.A =  \underbrace{A+A+...+A}_\text{\textit{d}}
\end{equation*}
```

$$d.A = \underbrace{A+A+...+A}_{d}$$

C Figures

C.1 Insert figures

```
\newfig{Mars Rover}{0.5}{MarsRover.jpg}{fig:rover}
```

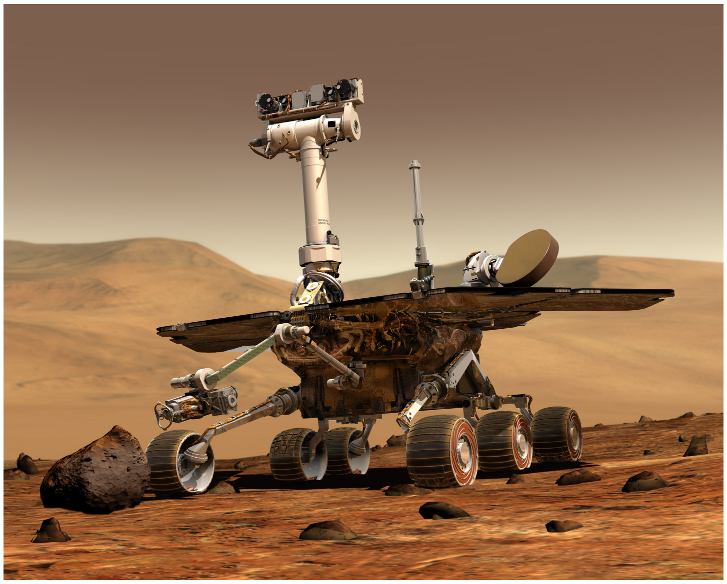

Figure 1: Mars Rover

C.2 Tables

```
\begin{tabular} {    |>{\centering\arraybackslash}p{3cm}|
    |>{\centering\arraybackslash}p{3cm}|
    >{\centering\arraybackslash}p{3cm}|
    >{\centering\arraybackslash}p{3cm}|
    >{\centering\arraybackslash}p{3cm}|
                }
\hline
\multicolumn{5}{|c|}{DH Parameter for SCARA manipulator} \\
\hline
Link \textit{i} & $a_i$ [m] & $\alpha_i$ [deg] & $d_i$ [m] & $\theta_i$ [deg] \\
\hline
1 & $a_1$   & 0     & 0     & *$\theta_1$\\
2 & $a_2$   & 180   & 0     & *$\theta_2$\\
3 & 0       & 0     & *$d_3$ & 0          \\
4 & 0       & 0     & $d_4$ & *$\theta_4$\\
```

```
\hline
\end{tabular}
```

DH Parameter for SCARA manipulator				
Link i	a_i [m]	α_i [deg]	d_i [m]	θ_i [deg]
1	a_1	0	0	$^*\theta_1$
2	a_2	180	0	$^*\theta_2$
3	0	0	$^*d_3$	0
4	0	0	d_4	$^*\theta_4$

D Labelling and referencing

D.1 Referencing

```
\boxeq{
    \frac{x}{2}+\frac{y}{2}=z
    \label{eqn:equation1}
}

I am referring to Eqn.\ref{eqn:equation1}.
```

$$\boxed{\frac{x}{2}+\frac{y}{2}=z \qquad (7)}$$

I am referring to Eqn.7.

D.2 Footnote

```
Time to peak is the time it takes to reach first peak of the output waveform\footnotemark.
As we know from calculus, to find a stationary point (peak) of a curve,
we need to find $t$ where $\dot{y}(t)=0$. \smallskip

\footnotetext{if its stable and oscillatory. Must be oscillatory as we're looking at a
 second order system. The amplitude of the output will increase exponentially if its
 unstable, that means first peak won't be the maximum peak.}
```

Example: (see bottom of this page and notice the footnote). Time to peak is the time it takes to reach first peak of the output waveform*. As we know from calculus, to find a stationary point (peak) of a curve, we need to find t where $\dot{y}(t) = 0$.

E Coding Snippets

E.1 Script file

```
\lstset{style=code_file}

\begin{lstlisting}[language=C++]
    #include <iostream>

    using namespace std;

    int main() {
```

*if its stable and oscillatory. Must be oscillatory as we're looking at a second order system. The amplitude of the output will increase exponentially if its unstable, that means first peak won't be the maximum peak.

```
        cout << "Hello world!" << endl;
        return 0;
    }

\end{lstlisting}
```

```
    #include <iostream>

    using namespace std;

    int main() {
        cout << "Hello world!" << endl;
        return 0;
    }
```

E.2 Output

```
\lstset{style=output}

\begin{lstlisting}
Hello world!
\end{lstlisting}
```

```
Hello world!
```