

LIST OF FIGURES

Figure 2.1 Gait cycle	16
Figure 2.2 Normal arch.....	17
Figure 2.3 Flat Feet.....	18
Figure 2.4 High Arch.....	18
Figure 2.5 Feet anatomy	20
Figure 2.6 Stage of rehabilitation	21
Figure 2.7 Motion capture	22
Figure 2.8 Inertial Measurement Units (IMU) illustration.....	22
Figure 2.9 Electromyography (EMG)	23
Figure 2.10 Plantar pressure mat	24
Figure 3.1 Research stages	26
Figure 3.2 Function diagram	28
Figure 3.3 Flowchart	29
Figure 3.4 Block diagram	30
Figure 3.5 Ground truth.....	31
Figure 3.6 Design Hardware.....	32
Figure 3.7 Workflow system illustration.....	33
Figure 3.8 Muscle component wiring.....	34
Figure 3.9 Insole wiring component.....	34
Figure 3.10 DF9-16 piezoresistive sensor	36
Figure 3.11 Power supply wiring for plantar pressure insole.....	36
Figure 3.12 3D device design	37
Figure 3.13 Implementation of the equation example.....	39
Figure 4.1 Correlation between voltage and pressure for the DF9-16 sensor	42
Figure 4.2 Hardware	44
Figure 4.3 Software output	44
Figure 4.4 EMG signal plot of subject 1	46
Figure 4.5 EMG signal plot of subject 2	46
Figure 4.6 EMG signal plot of subject 3	47
Figure 4.7 EMG signal plot of subject 4	47
Figure 4.8 EMG signal plot of subject 5	48
Figure 4.9 EMG signal plot of subject 6	48
Figure 4.10 Surface of plantar pressure insole	49
Figure 4.11 Result subject 1 standing static	50
Figure 4.12 Result subject 2 standing static	50
Figure 4.13 Result subject 3 standing static	51
Figure 4.14 Result subject 5 standing static	51
Figure 4.15 Result subject 4 standing static	51
Figure 4.16 Result subject 6 standing static	51
Figure 4.17 Upstairs experiment	52
Figure 4.18 Downstairs experiment	53
Figure 4.19 Walking phase subject 1	54

Figure 4.20 Walking phase subject 2	54
Figure 4.21 Walking phase subject 3	55
Figure 4.22 Walking phase subject 4	55
Figure 4. 23 Walking phase subject 5	56
Figure 4.24 Walking phase subject 6	56