LIST OF FIGURES

1.1	A figure shows that one of the example of contacting-devices ex- isted of human respiration: Electrocardiograph (ECG).	2
1.2	A figure shows that one of the example of contacting-devices ex-	_
	isted of human respiration; Spirometer.	3
1.3	A prototype simulation for detecting human respiratory rate	4
2.1	A figure shows that the human respiration which is caused by the	
	pulmonary activities is such a small displacement which can be gen-	
	erates by the radar system.	8
2.2	A figure explains the equation of (2.1)	9
2.3	A figure shows that the human respiration which is caused by the pulmonary activities is such a small displacement which can be gen-	
	erates by the radar system	9
2.4	A simple scheme of detector periodic chest wall movement which	
	is caused by phase shift	11
2.5	A figure shows that inside of the HB100 parts. In this thesis, a CW	
	radar is applied for detecting a small displacement of human chest	
	wall	13
3.1	A figure shows that the block diagram of proposed technique of	
	detection human chest wall movement (as a object detected) which	
	is from the respiration pattern	15
3.2	A periodic chest wall movement which is caused by phase shift.	
	The CW radar system is a scheme of module of HB100 is going	
	toing to detect the difference of human chest wall movement	18
3.3	A simple block diagram for detecting human respiratory rate	18
3.4	A figure shows that the resumption of detection human chest wall	
	movement which is from the respiration pattern	19
3.5	A figure shows that the experiment model of this thesis. The de-	
	tection of human chest wall is detected by the CW radar module of	
	HB100	21

3.6	A figure shows that the CW radar module of HB100. There are some part at this module to connected with the PC and power sup- ply. This module is for getting the results on the experimental model.	22
4.1	An LPF output in the time-domain which represents a three- different of respiration rate	25
4.2	An LPF output in the time-domain which represents a two-different of respiration rate.	25
4.3	An LPF output in the frequency-domain which represents a three- different of respiration rate	26
4.4	An LPF output in the frequency-domain which represents a two- different of respiration rate	26
4.5	An LPF output in time-domain for different respiration amplitude in 0.26 Hz	27
4.6	An LPF output in time-domain for different respiration amplitude in 0.33 Hz	27
4.7	An LPF output in time-domain for different respiration amplitude in 0.5 Hz	27
4.8	An LPF output in time-domain for different respiration amplitude in 0.74 Hz	28
4.9	An LPF output in time-domain for different respiration amplitude in 0.84 Hz	28
4.10	An LPF output in frequency-domain for two-different respiration amplitude with the respiration rate of 0.33 Hz	29
4.11	The normalized spectrum of LPF output for adult human respiration cases.	29
4.12	The normalized spectrum of LPF output for children human respiration cases	30
4.13	The normalized spectrum of LPF output for toddler human respira- tion cases	30
4.14	The normalized spectrum of LPF output for newborn human respi- ration cases	31
4.15	The normalized spectrum of LPF output for infants human respira- tion cases	31
4.16	A power spectrum of normalized LPF output	32
4.17	A figure shows that the three-different respiration rate in normalized	
	value	34

- 4.18 A figure shows that the three-different respiration amplitude in nor-malized value. This result represents of 0 times/minutes of respiration. 35