

## LIST OF FIGURES

2.1	Internet of Things illustration . . . . .	7
2.2	Internet of Things infrastructure . . . . .	7
2.3	Raspberry Pi 3B+ . . . . .	8
2.4	DHT22 Sensor . . . . .	10
2.5	GY-302 BH1750 Sensor . . . . .	10
2.6	YL-69 Sensor . . . . .	11
2.7	Relay . . . . .	11
2.8	ADC ADS1115 . . . . .	12
2.9	Water pump . . . . .	12
2.10	Celery plant . . . . .	13
2.11	MySQL . . . . .	14
2.12	Decision tree model illustration[1] . . . . .	15
3.1	The proposed machine learning phase used in this thesis . . . . .	23
3.2	The proposed work flow of the observation data retrieval used in this thesis . . . . .	25
3.3	The proposed work flow of the observation data storing management used in this thesis . . . . .	27
3.4	The proposed diagram block used in this thesis . . . . .	28
3.5	The proposed system flowchart used in this thesis . . . . .	30
3.6	The greenhouse outside view . . . . .	33
3.7	The tool and component . . . . .	33
3.8	The greenhouse inside view . . . . .	34
3.9	The proposed percentage train/test data of prediction model . . . . .	37
4.1	The visualization of room temperature attribute in this thesis . . . . .	41
4.2	The visualization of room humidity attribute in this thesis . . . . .	42
4.3	The visualization of light intensity attribute in this thesis . . . . .	42
4.4	The visualization of plant height in this thesis . . . . .	43
4.5	The overview of delay test result . . . . .	44
4.6	The overview of throughput test result . . . . .	44
4.7	The overview of data retrieved in this thesis . . . . .	46
4.8	The overview of total data preparation in this thesis . . . . .	46

4.9	The overview of data preparation information in this thesis . . . . .	47
4.10	The overview of soil moisture count plot in this thesis . . . . .	47
4.11	The overview of soil moisture value plot in this thesis . . . . .	48
4.12	The overview of plant status count plot in this thesis . . . . .	48
4.13	The overview of plant status value plot in this thesis . . . . .	48
4.14	The overview of correlation matrix in this thesis . . . . .	49
4.15	The overview of label encoder in this thesis . . . . .	50
4.16	The overview of pearson correlation matrix in this thesis . . . . .	50
4.17	The overview of classification tree using gini parameter in this thesis	51
4.18	The overview of classification tree in this thesis . . . . .	52
4.19	The overview of accuracy score process in this thesis . . . . .	52
4.20	The overview of accuracy score in this thesis . . . . .	52
4.21	The overview of confusion matrix in this thesis . . . . .	53
4.22	The overview of classification process in this thesis . . . . .	53
4.23	The overview of classification report in this thesis . . . . .	53
4.24	The overview of model training in this thesis . . . . .	54