

## DAFTAR GAMBAR

|   |    |
|---|----|
| <b>Gambar 1. 1</b> Data Kualitas udara IQAir.com .....                              | 2  |
| <b>Gambar 1. 2</b> Data rata-rata Konsentrasi Polutan di Indonesia .....            | 2  |
| <b>Gambar 1. 3</b> Stasiun pemantauan kualitas udara .....                          | 8  |
| <b>Gambar 1. 4</b> Sistem pemantauan kualitas udara luar ruangan.....               | 9  |
| <b>Gambar 1. 5</b> AQMS Mobile atau Shelter .....                                   | 9  |
| <b>Gambar 1. 6</b> Xiaomi mijia air detector .....                                  | 10 |
| <b>Gambar 3. 1</b> Contoh Penggunaan Wearable .....                                 | 22 |
| <b>Gambar 3. 2</b> Sensirion SPS30.....   | 24 |
| <b>Gambar 3. 3</b> Proses pembacaan Particulate matter pada SPS30 .....             | 25 |
| <b>Gambar 3. 4</b> Boschtech BME280 .....   | 27 |
| <b>Gambar 3. 5</b> Diagram Blok Jalur Sinyal Sensor SGP30 .....                     | 28 |
| <b>Gambar 3. 6</b> Mikrokontroler Xiao Seeed ESP32 C3.....                          | 30 |
| <b>Gambar 3. 7</b> Layar TFT ST7735 .....   | 32 |
| <b>Gambar 3. 8</b> Charger controller TP4056 Step Up .....                          | 32 |
| <b>Gambar 3. 9</b> Flowchart sistem kerja alat .....                                | 34 |
| <b>Gambar 3. 10</b> Diagram Blok alat.....  | 34 |
| <b>Gambar 3. 11</b> Casing tampak depan .....                                       | 35 |
| <b>Gambar 3. 12</b> Casing tampak belakang .....                                    | 35 |
| <b>Gambar 3. 13</b> Casing bagian dalam.....  | 36 |
| <b>Gambar 3. 14</b> Casing tampak kanan .....                                       | 36 |
| <b>Gambar 3. 15</b> Casing tampak kiri .....  | 36 |
| <b>Gambar 3. 16</b> Bagian belakang tutup casing .....                              | 37 |
| <b>Gambar 3. 17</b> Ilustrasi Penggunaan device .....                               | 37 |
| <b>Gambar 3. 18</b> Ilustrasi penggunaan terbaik .....                              | 38 |
| <b>Gambar 3. 19</b> mockup tampilan awal website.....                               | 39 |
| <b>Gambar 3. 20</b> mockup tampilan page registrasi .....                           | 40 |
| <b>Gambar 3. 21</b> mockup tampilan page login website.....                         | 40 |
| <b>Gambar 3. 22</b> mockup tampilan page menu utama .....                           | 40 |
| <b>Gambar 3. 23</b> mockup informasi detail terkait data history .....              | 41 |
| <b>Gambar 3. 24</b> mockup informasi detail terkait data histori dan tracking ..... | 41 |
| <b>Gambar 3. 25</b> Flowchart Sistem Software.....                                  | 43 |
| <b>Gambar 3. 26</b> Tampilan awal aplikasi .....                                    | 44 |
| <b>Gambar 3. 27</b> Tampilan Utama.....   | 45 |
| <b>Gambar 4. 1</b> Sistem umum .....  | 50 |
| <b>Gambar 4. 2</b> Flowchart Hardware .....   | 52 |
| <b>Gambar 4. 3</b> Flowchart website AirGradien .....                               | 54 |
| <b>Gambar 4. 4</b> Perancangan Aplikasi.....  | 55 |
| <b>Gambar 4. 5</b> Flowchart Aplikasi.....  | 56 |
| <b>Gambar 4. 6</b> Flowchart Login dan Regis App .....                              | 57 |
| <b>Gambar 4. 7</b> Flowchart Connect Bluetooth .....                                | 58 |
| <b>Gambar 4. 8</b> Flowchart Sistem Aplikasi .....                                  | 59 |
| <b>Gambar 4. 9</b> Flowchart Tracking app .....                                     | 60 |
| <b>Gambar 4. 10</b> Flowchart Grafik.....   | 61 |

|   |                                     |
|---|-------------------------------------|
| <b>Gambar 4. 11</b> Flowchart History .....                             | 62                                  |
| <b>Gambar 4. 12</b> Flowchart Profile .....                             | 63                                  |
| <b>Gambar 4. 13</b> Tampilan LandingPage .....                          | 64                                  |
| <b>Gambar 4. 14</b> Registrasi Page Dashboard .....                     | 65                                  |
| <b>Gambar 4. 15</b> Login Page Dashboard.....                           | 65                                  |
| <b>Gambar 4. 16</b> Flowchart Login dan Regis Web.....                  | 66                                  |
| <b>Gambar 4. 17</b> Flowchart Dashboard.....                            | 67                                  |
| <b>Gambar 4. 18</b> Tampilan Dashboard .....                            | 67                                  |
| <b>Gambar 4. 19</b> Flowchart Grafik.....                               | 68                                  |
| <b>Gambar 4. 20</b> Tampilan Halaman Grafik .....                       | 68                                  |
| <b>Gambar 4. 21</b> Flowchart Tracking.....                             | 69                                  |
| <b>Gambar 4. 22</b> Tampilan Halaman Tracking.....                      | 69                                  |
| <b>Gambar 4. 23</b> Flowchart History .....                             | 70                                  |
| <b>Gambar 4. 24</b> Tampilan Halaman History .....                      | 71                                  |
| <b>Gambar 4. 25</b> Halaman History 7 hari.....                         | 72                                  |
| <b>Gambar 4. 26</b> History location .....                              | 73                                  |
| <b>Gambar 4. 27</b> Flowchart Profile .....                             | 74                                  |
| <b>Gambar 4. 28</b> Halaman Profile .....                               | 74                                  |
| <b>Gambar 4. 29</b> Tampilan LandingPage .....                          | 75                                  |
| <b>Gambar 4. 30</b> Tampilan Login dan Registrasi.....                  | 76                                  |
| <b>Gambar 4. 31</b> Tampilan Halaman Utama .....                        | 76                                  |
| <b>Gambar 4. 32</b> Tampilan Halaman Grafik .....                       | 77                                  |
| <b>Gambar 4. 33</b> Tampilan Halaman Tracking.....                      | 78                                  |
| <b>Gambar 4. 34</b> Tampilan Halaman History .....                      | 79                                  |
| <b>Gambar 4. 35</b> Tampilan Halaman Profile .....                      | 80                                  |
| <b>Gambar 4. 36</b> Diagram Kalibrasi Sistematika Pengujian .....       | 81                                  |
| <b>Gambar 4. 37</b> Skema Kalibrasi Suhu.....                           | 83                                  |
| <b>Gambar 4. 38</b> Skema Kalibrasi Humidity .....                      | 84                                  |
| <b>Gambar 4. 39</b> Skema Kalibrasi PM.....                             | 86                                  |
| <b>Gambar 4. 40</b> Skema pengujian validasi sensor .....               | 87                                  |
| <b>Gambar 4. 41</b> Flowchart Backend .....                             | 89                                  |
| <b>Gambar 4. 42</b> Flowchart Validasi Data.....                        | 90                                  |
| <b>Gambar 4. 43</b> Flowchart Validasi Data.....                        | 92                                  |
| <b>Gambar 4. 44</b> Grafik Validasi Data eCO <sub>2</sub> .....         | 93                                  |
| <b>Gambar 4. 45</b> Grafik Boxplot Validasi Data eCO <sub>2</sub> ..... | <b>Error! Bookmark not defined.</b> |
| <b>Gambar 5. 1</b> Grafik Persamaan Kalibrasi Temperature.....          | 112                                 |
| <b>Gambar 5. 2</b> Grafik Kalibrasi <i>Humidity</i> .....               | 114                                 |
| <b>Gambar 5. 3</b> Grafik Kalibrasi PM 2.5 .....                        | 116                                 |
| <b>Gambar 5. 4</b> Grafik Kalibrasi PM 2.5 .....                        | 118                                 |
| <b>Gambar 5. 5</b> Grafik Validasi TVOC .....                           | 120                                 |
| <b>Gambar 5. 6</b> Grafik Data PM <sub>2.5</sub> .....                  | 122                                 |

|   |     |
|---|-----|
| <b>Gambar 5. 7</b> <i>Boxplot</i> PM2.5 .....                           | 123 |
| <b>Gambar 5. 8</b> Grafik Data ECO2 .....                               | 124 |
| <b>Gambar 5. 9</b> <i>Boxplot</i> Eco2.....                             | 125 |
| <b>Gambar 5. 10</b> Grafik Data TVOC.....                               | 128 |
| <b>Gambar 5. 11</b> Grafik Data PM10.....                               | 129 |
| <b>Gambar 5. 12</b> Grafik Data <i>Temperature</i> .....                | 131 |
| <b>Gambar 5. 13</b> Grafik Data <i>Humidity</i> .....                   | 132 |
| <b>Gambar 5. 14</b> Grafik Data <i>Pressure</i> .....                   | 133 |
| <b>Gambar 5. 15</b> Grafik Konektivitas <i>Bluetooth</i> .....          | 134 |
| <b>Gambar 5. 16</b> Grafik Level dan Dosis.....                         | 136 |
| <b>Gambar 5. 17</b> Hasil Akhir Pengujian Performa <i>Website</i> ..... | 140 |