

Rancang Bangun Sistem Monitoring Kontraksi Ibu Hamil Berbasis IoT

Oleh:

Sahrul Romadhoni

Dosen Pembimbing : Indah Sulistiyowati

Progam Studi

Universitas Muhammadiyah Sidoarjo

Januari, 2024

Pendahuluan

Persalinan atau proses melahirkan merupakan sesuatu yang akan dialami pada setiap perempuan yang sudah menikah. Proses melahirkan akan berlangsung dengan sendirinya apabila umur janin sudah mencapai 37 sampai 42 minggu, Proses melahirkan ini cukup sulit karena melibatkan banyak perawatan untuk kesehatan ibu dan anak, sehingga membutuhkan pemantauan, perawatan, dan pemeliharaan dengan fasilitas yang terpelihara dengan baik.



← Parenting Corner

Berikut Tanda Pembukaan pada Persalinan

07 August 2023

Setelah mengandung selama 9 bulan, momen persalinan adalah saat yang ditunggu-tunggu oleh ibu hamil. Persalinan atau melahirkan adalah proses alami di mana bayi dikeluarkan dari rahim ibu.

Persalinan diawali dengan kontraksi rahim dan melebarnya mulut rahim dan diakhiri dengan lahirnya bayi.

Semakin mendekati waktu kelahiran, ibu hamil akan mulai merasakan beberapa tanda fisik bahwa ia akan segera melahirkan, termasuk kontraksi dan pembukaan pada persalinan.

Tanda Awal Ibu akan Melahirkan

1. Kontraksi Rahim

Kontraksi rahim adalah tanda paling umum dari persalinan. Otot rahim mengalami kontraksi untuk membantu mendorong bayi keluar dari rahim. Selanjutnya...

Pertanyaan Penelitian (Rumusan Masalah)

1. Cara mengetahui kontraksi dalam keadaan real time ?
2. Membantu tenaga kesehatan terutama bidan dalam menjalankan tugas dalam penanganan ibu hamil.

Metode

METODE ADDIE

Model ADDIE bergantung pada setiap tahap yang dilakukan dalam urutan yang diberikan. Namun, dengan fokus pada refleksi dan literasi. Model ini memberi pendekatan yang berfokus pada pemberian umpan balik untuk perbaikan terus-menerus

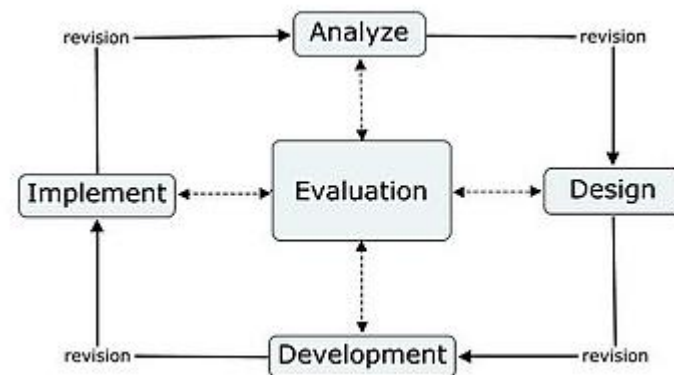
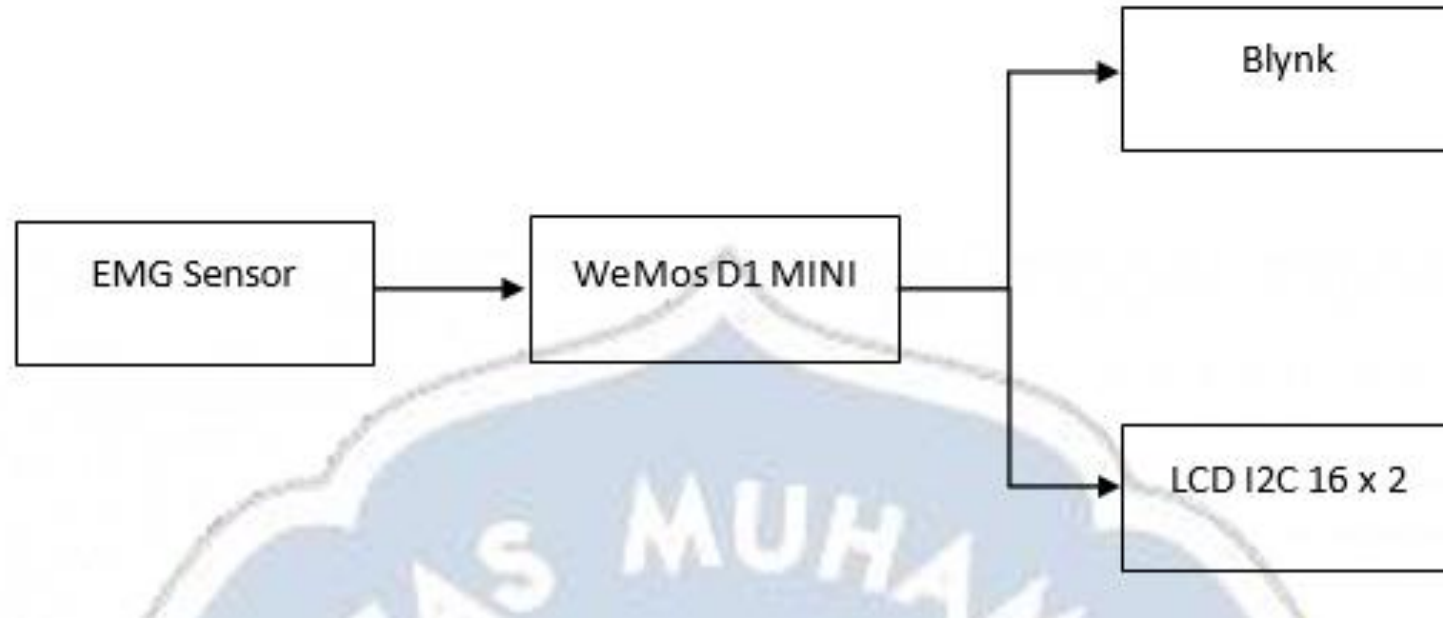


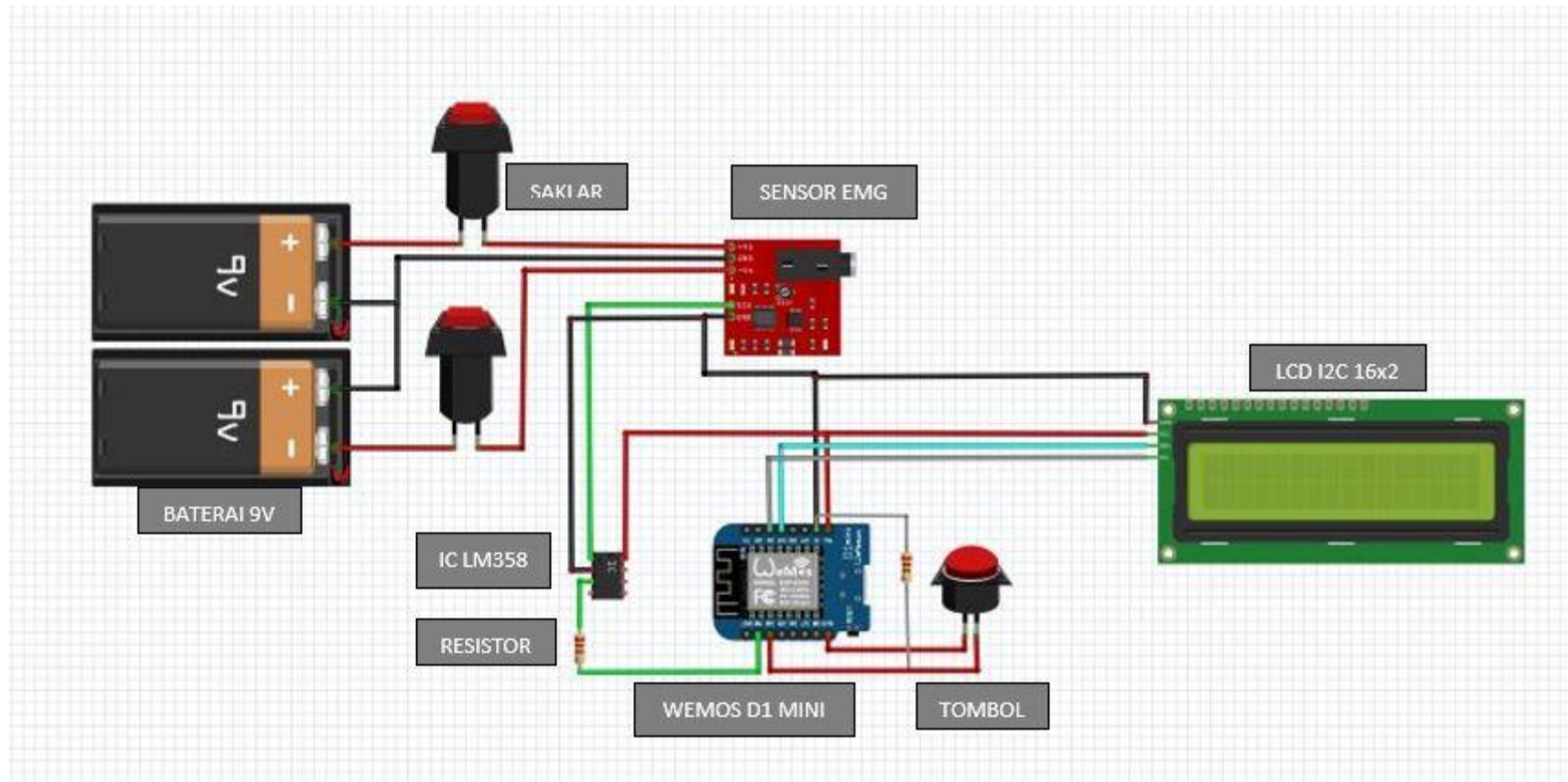
Diagram Blok



Flowchart



Wiring Diagram



Pembahasan

Alat ini mampu memonitoring kontraksi ibu hamil yang akan melahirkan sehingga tenaga medis tidak perlu mengecek setiap saat kondisi dari perut ibu, perancangan alat monitoring ini menggunakan WeMos D1 Mini yang berfungsi sebagai pengendali dalam sistem pengontrolan perangkat keras maupun ke platform IoT Blynk. Kecepatan internet atau WiFi yang kurang baik dan tidak stabil sangat mempengaruhi proses pengiriman data dari sensor ke platform IoT tersebut.

Pembahasan

Table 1 Trial Mrs D 5th child 42 weeks gestation

Condition	Muscle state of relaxation	State of muscle contraction
1	55	70
2	53	72
3	58	75
4	60	80
5	61	82
Average	57,4	75,8

Table 2 Trial Mrs. R 2nd child 39 weeks gestation

Condition	Muscle state of relaxation	State of muscle contraction
1	62	72
2	69	76
3	67	71
4	58	82
5	57	84
Average	62,5	77

Table 3 Trial Mrs B 2nd child 39 weeks gestation

Condition	Muscle state of relaxation	State of muscle contraction
1	63	70
2	67	79
3	58	80
4	62	73
5	64	86
Average	62,8	77,4

Manfaat Penelitian

Manfaat dari skripsi dengan judul “Rancang Bangun Sistem Monitoring Kontraksi Ibu Hamil Berbasis IOT” adalah dapat membantu tenaga medis terutama bidan dalam menangani ibu hamil yang akan melahirkan sehingga tidak perlu mengecek dan mencatat secara manual.

Referensi

- [1] S. A. Abbas, R. Riaz, S. Z. H. Kazmi, S. S. Rizvi, and S. J. Kwon, "Cause Analysis of Caesarian Sections and Application of Machine Learning Methods for Classification of Birth Data," *IEEE Access*, vol. 6, pp. 67555–67561, 2018, doi: 10.1109/ACCESS.2018.2879115.
- [2] S. AL-Hagree et al., "Decision Tree based Smart System for Pregnant Women Diagnosis," in *2022 International Conference on Intelligent Technology, System and Service for Internet of Everything (ITSS-IoE)*, 2022, pp. 1–6. doi: 10.1109/ITSS-IoE56359.2022.9990953.
- [3] G. Wicahyono, A. Setyanto, S. Raharjo, and A. Munandar, "Pregnancy Monitoring Mobile Application User Experience Assessment," in *2019 International Conference on Information and Communications Technology (ICOI ACT)*, 2019, pp. 872–877. doi: 10.1109/ICOI ACT46704.2019.8938446.
- [4] H. Allahem and S. Sampalli, "Automated uterine contractions pattern detection framework to monitor pregnant women with a high risk of premature labour," *Inform Med Unlocked*, vol. 20, p. 100404, 2020, doi: <https://doi.org/10.1016/j.imu.2020.100404>.
- [5] A. Bin Queyam, R. K. Meena, S. K. Pahuja, and D. Singh, "An IoT Based Multi-Parameter Data Acquisition System for Efficient Bio-Telemonitoring of Pregnant Women at Home," in *2018 8th International Conference on Cloud Computing, Data Science & Engineering (Confluence)*, 2018, pp. 14–15. doi: 10.1109/CONFLUENCE.2018.8442686.
- [6] D. Hao et al., "Application of decision tree in determining the importance of surface electrohysterography signal characteristics for recognizing uterine contractions," *Biocybern Biomed Eng*, vol. 39, no. 3, pp. 806–813, 2019, doi: <https://doi.org/10.1016/j.bbe.2019.06.008>.
- [7] A. A. Falevskaya and Y. O. Bobrova, "The Development of a Web App for Monitoring Fetal Growth," in *2022 Conference of Russian Young Researchers in Electrical and Electronic Engineering (ElConRus)*, 2022, pp. 1507–1510. doi: 10.1109/ElConRus54750.2022.9755547.
- [8] R. Ramprabhu, S. Suresh, K. Latha, and D. Venkatesh, "Virtual Midwife for Pregnant Women and Alert System," in *2021 4th International Conference on Computing and Communications Technologies (ICCCT)*, 2021, pp. 574–579. doi: 10.1109/ICCCT53315.2021.9711892.
- [9] B. Wiweko et al., "Jakpros: Reproductive Health Education Application for Pregnant Women," in *2018 International Conference on Advanced Computer Science and Information Systems (ICACSIS)*, 2018, pp. 225–229. doi: 10.1109/ICACSIS.2018.8618206.
- [10] Y. Gupta, S. Kumar, and V. Mago, "Pregnancy Health Monitoring System based on Biosignal Analysis," in *2019 42nd International Conference on Telecommunications and Signal Processing (TSP)*, 2019, pp. 664–667. doi: 10.1109/TSP.2019.8769074.

Referensi

- [11] T. G. Troyee, M. K. Raihan, and M. S. Arefin, "Health Monitoring of Expecting Mothers using Multiple Sensor Approach: 'Preg Care,'" in *2020 2nd International Conference on Advanced Information and Communication Technology (ICAICT)*, 2020, pp. 77–82. doi: 10.1109/ICAICT51780.2020.9333514.
- [12] A. Bagwari and K. Gairola, "An Aid for Health monitoring during pregnancy," in *2021 10th IEEE International Conference on Communication Systems and Network Technologies (CSNT)*, 2021, pp. 805–809. doi: 10.1109/CSNT51715.2021.9509654.
- [13] L. L. Weitzel, K. G. Howen, B. M. Sibai, S. P. Chauhan, and B. L. Pineles, "iMOVE: a pilot study of a smartphone based application to encourage ambulation in pregnant Individuals," *Am J Obstet Gynecol MFM*, vol. 5, no. 8, p. 101037, 2023, doi: <https://doi.org/10.1016/j.ajogmf.2023.101037>.
- [14] S. Sharma *et al.*, "SwasthGarbh: A Smartphone App for Improving the Quality of Antenatal Care and Ameliorating Maternal-Fetal Health," *IEEE J Biomed Health Inform*, vol. 27, no. 6, pp. 2729–2738, 2023, doi: 10.1109/JBHI.2022.3211426.
- [15] I. Sulistiyowati and M. Imam Muhyiddin, "Disinfectant Spraying Robot to Prevent the Transmission of the Covid-19 Virus Based on the Internet of Things (IoT)," *Journal of Electrical Technology UMY (JET-UMY)*, vol. 5, no. 2, 2021.
- [16] Y. C. Jo, H. N. Kim, W. H. Hwang, H. K. Hong, Y. S. Choi, and S. W. Jung, "Wearable Patch Device for Uterine EMG and Preterm Birth Monitoring Applications," in *TENCON 2018 - 2018 IEEE Region 10 Conference*, 2018, pp. 1127–1130. doi: 10.1109/TENCON.2018.8650268.
- [17] S. Sarafan *et al.*, "Development of a Home-based Fetal Electrocardiogram (ECG) Monitoring System," in *2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, 2021, pp. 7116–7119. doi: 10.1109/EMBC46164.2021.9630827.
- [18] Z. Zhang, J. Wu, G. Li, W. Liu, and X. Tang, "Separating fetal ECG from transabdominal electrical signal: An application of AE-UNet3+," in *BIBE 2022; The 6th International Conference on Biological Information and Biomedical Engineering*, 2022, pp. 1–5.
- [19] B. Wang and J. Saniie, "Fetal Electrocardiogram Recognition Using Multilayer Perceptron Neural Network," in *2018 IEEE International Conference on Electro/Information Technology (EIT)*, 2018, pp. 434–437. doi: 10.1109/EIT.2018.8500232.
- [20] R. Ettiyan and V. Geetha, "A Survey of Health Care Monitoring System for Maternity Women Using Internet-of-Things," in *2020 3rd International Conference on Intelligent Sustainable Systems (ICISS)*, 2020, pp. 1290–1296. doi: 10.1109/ICISS49785.2020.9315950

Referensi

- [21] K. N. Risnawati, "Gambaran Jenis Persalinan Pada Ibu Bersalin Dengan Corona Virus Disease 19 Di Rumah Sakit Umum Daerah Wangaya Denpasar," *Kebidanan*, vol. 1, no. 2, pp. 6–19, 2021.
- [22] R. Multajam, W. S. M. Sanjaya, A. Sambas, M. N. Subkhi, and I. Muttaqien, "Desain dan Analisis Electromyography (EMG) serta Aplikasinya dalam Mendeteksi Sinyal Otot," *Al-HAZEN J. Phys.*, vol. 2, no. 2, pp. 37–47, 2016.
- [23] F. T. Abyanto and F. B. Setiawan, "Deteksi Kejenuhan Seluruh Otot Manusia Menggunakan Sensor Emg Berbasis Mikrokontroler Arduino Uno," pp. 69–74, 2019, doi: 10.5614/sniko.2018.11.
- [24] H. H. Abrianto, K. Sari, and I. Irmayani, "Sistem Monitoring Dan Pengendalian Data Suhu Ruang Navigasi Jarak Jauh Menggunakan WEMOS D1 Mini," *J. Nas. Komputasi dan Teknol. Inf.*, vol. 4, no. 1, pp. 38–49, 2021, doi: 10.32672/jnkti.v4i1.2687.

