

The background of the page is a repeating geometric pattern. It consists of two main motifs: a teal-colored cross with rounded ends and a yellow-green diamond shape with a white center. These motifs are arranged in a grid, alternating in a checkerboard pattern. The teal crosses are positioned at the corners of the grid, while the yellow-green diamonds are in the center of each grid square. The overall effect is a rhythmic, symmetrical design.

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- [1] K. Ho *et al.*, “Multi sensor approach to detection of heartbeat and respiratory rate aided by fuzzy logic,” *2010 IEEE World Congr. Comput. Intell. WCCI 2010*, 2010, doi: 10.1109/FUZZY.2010.5584045.
- [2] P. B. Adamson *et al.*, “Pulmonary Artery Pressure-Guided Heart Failure Management Reduces 30-Day Readmissions,” *Circ. Hear. Fail.*, vol. 9, no. 6, 2016, doi: 10.1161/CIRCHEARTFAILURE.115.002600.
- [3] “D. D. McManus *et al.*, “Abstract 319: Transthoracic Bioimpedance Monitoring Predicts Heart Failure Decompensation and Early Readmission after Heart Failure Hospitalization: Preliminary Data from SENTINEL-HF,” *Circ. Cardiovasc. Qual. Outcomes*, vol. 7, no. suppl_1, 2014, doi: 10.1161/circoutcomes.7.suppl_1.319.
- [4] A. Panahi, A. Hassanzadeh, and A. Moulavi, “Design of a low cost, double triangle, piezoelectric sensor for respiratory monitoring applications,” *Sens. Bio-Sensing Res.*, vol. 30, no. September, p. 100378, 2020, doi: 10.1016/j.sbsr.2020.100378.

- [5] J. V. Rundo, "Obstructive sleep apnea basics," *Cleve. Clin. J. Med.*, vol. 86, pp. 2–9, 2019, doi: 10.3949/CCJM.86.S1.02.
- [6] A. V Benjafield *et al.*, "Sleep Apnoea: a Literature-Based Analysis," *Lancet RespirMed*, vol. 7, no. 8, pp. 687–698, 2019, doi: 10.1016/S2213-2600(19)30198-5.Estimation.
- [7] S. Yoon and Y. H. Cho, "A skin-attachable flexible piezoelectric pulse wave energyharvester," *J. Phys. Conf. Ser.*, vol. 557, no. 1, 2014, doi: 10.1088/1742-6596/557/1/012026.
- [8] C. T. Huang, C. L. Shen, C. F. Tang, and S. H. Chang, "A wearable yarn-based piezo- resistive sensor," *Sensors Actuators, A Phys.*, vol. 141, no. 2, pp. 396–403, 2008, doi:10.1016/j.sna.2007.10.069.
- [9] S. Preetam and S. Panda, "Piezoelectric Devices in Biomedical Applications," *Acad. Lett.*, 2021, doi: 10.20935/al1407.
- [10] Dimurthada, Melinda, Elizar, and Ernita Dewi Meutia, "Analisis Filter Finite Impulse Response (FIR) pada Sinyal Electroensephalogram (EEG)," *Semin. Nas. Dan Expo Tek. Elektro*, pp. 101–104, 2019.

- [11] M. Gelombang and S. Gempa, “Implementasi moving average filter pada mikrokontroler sebagai peredam noise sensor piezo elektrik untuk mendeteksi gelombang seismik (gempa bumi),” no. November, pp. 1–8, 2014.
- [12] S. Liu, “Improved regression models for ventilation estimation based on chest and abdomen movements,” 2012, doi: 10.1088/0967-3334/33/1/79.
- [13] P. S. Wardana, “Processing of Respiration Signals Using FIR Filter for Analyze the Condition of Lung,” pp. 229–233, 2017.
- [14] S. Liu, Q. He, R. X. Gao, and P. Freedson, “Empirical Mode Decomposition Applied to Tissue Artifact Removal from Respiratory Signal,” pp. 3624–3627, 2008.
- [15] C. Massaroni, A. Nicolò, D. Lo Presti, M. Sacchetti, S. Silvestri, and E. Schena, “Contact-based methods for measuring respiratory rate,” *Sensors (Switzerland)*, vol.19, no. 4, pp. 1–47, 2019, doi: 10.3390/s19040908.
- [16] U. I. C. Monitoring, “Journal of Intelligent Material Systems and Structures Development of a PVDF

- Piezopolymer Sensor for,” *J. Intell. Mater. Syst. Struct.*, pp. 1–7, 2003, doi: 10.1177/104538903033639.
- [17] P. Lopez-Meyer, E. Sazonov, and B. Cheung, “Comparative sensor analysis for an electronic wearable and non-invasive respiratory signal acquisition system,” *Proc. Int. Conf. Sens. Technol. ICST*, pp. 805–808, 2012, doi: 10.1109/ICSensT.2012.6461788.
- [18] F. Peng, Z. Zhang, X. Gou, H. Liu, and W. Wang, “Motion artifact removal from photoplethysmographic signals by combining temporally constrained independent component analysis and adaptive filter,” 2014.
- [19] I. Mahbub *et al.*, “A Low-Power Wireless Piezoelectric Sensor-Based Respiration Monitoring System Realized in CMOS Process,” *IEEE Sens. J.*, vol. 17, no. 6, pp. 1858–1864, 2017, doi: 10.1109/JSEN.2017.2651073.
- [20] M. Gaiduk, D. Wehrle, R. Seepold, and J. A. Ortega, “Non-obtrusive system for overnight respiration and heartbeat tracking,” *Procedia Comput. Sci.*, vol. 176, pp. 2746–2755, 2020, doi:

10.1016/j.procs.2020.09.282.

- [21] C. Leonard and N. H. Shabrina, “Analisis Keefektifan Penggunaan Filter FIR dan IIR pada Sinyal Pernapasan EMGdi dengan Simulasi MATLAB,” *Ultim. Comput. J. Sist.Komput.*, vol. 12, no. 1, pp. 29–34, 2020, doi: 10.31937/sk.v12i1.1618.
- [22] Y. Y. Lin, H. T. Wu, C. A. Hsu, P. C. Huang, Y. H. Huang, and Y. L. Lo, “Sleep ApneaDetection Based on Thoracic and Abdominal Movement Signals of Wearable Piezoelectric Bands,” *IEEE J. Biomed. Heal. Informatics*, vol. 21, no. 6, pp. 1533– 1545, 2017, doi: 10.1109/JBHI.2016.2636778.
- [23] S. Subairi, D. C. Permatasari, W. Dirgantara, Y. Surya Akbar Gumilang, I. Zahroya J.M.F., and H. Haitsam, “Deteksi Sleep Apnea Menggunakan Metode Decision Tree dengan Fitur Statistik RR Interval,” *J. EECCIS (Electrics, Electron. Commun. Control. Informatics, Syst.*, vol. 16, no. 3, pp. 96–100, 2022, doi:10.21776/jeccis.v16i3.1603.
- [24] A. M. Osman, S. G. Carter, J. C. Carberry, and D. J. Eckert, “Obstructive sleep apnea: current perspectives,” *Nat. Sci. Sleep*, vol. 10, no. 2018, pp.

21–34, 2018, doi: 10.2147/NSS.S124657.

- [25] M. Melanie Lyons *et al.*, “Screening for obstructive sleep apnea in commercial drivers using EKG-derived respiratory power index,” *J. Clin. Sleep Med.*, vol. 15, no. 1, pp. 23–32, 2019, doi: 10.5664/jcsm.7562.
- [26] H. P. Chang, Y. F. Chen, and J. K. Du, “Obstructive sleep apnea treatment in adults,” *Kaohsiung J. Med. Sci.*, vol. 36, no. 1, pp. 7–12, 2020, doi: 10.1002/kjm2.12130.
- [27] D. A. Firmansyah and E. Yulianto, “Analysis of Abdominal Respiratory Sensor Performance in Sleep Apnea Conditions,” *J. Teknokes*, vol. 16, no. 1, pp. 21–29, 2023.
- [28] A. Oppenheim and R. Schafer, “Discrete-Time Processing- Second Edition.” 1999.
- [29] Y. P. Huang, M. S. Young, and C. C. Tai, “Noninvasive respiratory monitoring system based on the piezoceramic transducer’s pyroelectric effect,” *Rev. Sci. Instrum.*, vol. 79, no. 3, 2008, doi: 10.1063/1.2889398.
- [30] C. Kaushik, G. Sahitya, V. Krishna Sree, and R.

Rohan, “Signal processing techniques for removal of various artifacts from obstructive sleep apnea signals,” *Int. J. Innov. Technol. Explor. Eng.*, vol. 8, no. 12, pp. 430–435, 2019, doi: 10.35940/ijitee.L3317.1081219.

- [31] A. Atina, “Aplikasi Matlab pada Teknologi Pencitraan Medis,” *J. Penelit. Fis. dan Ter.*, vol. 1, no. 1, p. 28, 2019, doi: 10.31851/jupiter.v1i1.3123.
- [32] L. B. Setyawan, “Prinsip Kerja dan Teknologi OLED,” *Techné J. Ilm. Elektrotek.*, vol. 16, no. 02, pp. 121–132, 2017, doi: 10.31358/techne.v16i02.165.