

DAFTAR PUSTAKA

- (2020) Miniature strain sensors measure large forces even in confined spaces, Available at: <https://www.automate.org/vision/news/miniature-strain-sensors-measure-large-forces-even-in-confined-spaces> (Accessed 3 March 2025)
- (2023) Creality K1/ K1 Max Brass Nozzle 0,4 mm' - 3D Hub Shop. Available at: <https://3dhub.mk/product/creality-k1-k1-max-brass-nozzle-04-mm> (Accessed 3 March 2025)
- (2024) Elastic Strain Sensor Market Size, Share, Growth, and Industry Analysis, By Type (Resistive, Capacitive, Others), By Application (Medical Insurance, Motion Detection, Human-computer, Interaction, Others), Regional Forecast To 2032. Available at :<https://www.businessresearchinsights.com/market-reports/elastic-strain-sensor-market-104504> (Accessed 11 October 2024)
- (2024) Strain sensors & strain gauges, Available at: <https://www.althensensors.com/sensors/strain-sensors-strain-gauges/> (Accessed 11 October 2024)
- Ajaero, C.K. *et al.* (2016) 'Access to mass media messages, and use of family planning in Nigeria: a spatio-demographic analysis from the 2013 DHS', *BMC Public Health*, 16(1), p. 427. Available at: <https://doi.org/10.1186/s12889-016-2979-z>.
- Alqaderi, A.I.J. and Ramakrishnan, N. (2025) 'Carbon-based flexible strain sensors: Recent advances and performance insights in human motion detection', *Chemical Engineering Journal*, 513, p. 162609. Available at: <https://doi.org/10.1016/j.cej.2025.162609>.
- Appavoo, D. *et al.* (2024) 'Four-Dimensional Printing of Multi-Material Origami and Kirigami-Inspired Hydrogel Self-Folding Structures', *Materials*, 17(20), p. 5028. Available at: <https://doi.org/10.3390/ma17205028>.
- Arunprasath, K. *et al.* (2022) 'Development in Additive Manufacturing Techniques', in, pp. 33–53. Available at: https://doi.org/10.1007/978-3-030-89401-6_2.
- Baset, S.A. *et al.* (2022) 'Solving Multi-Response Problem Using Goal Programming Approach and Quantile Regression', *Mathematics and Statistics*, 10(1), pp. 201–214. Available at: <https://doi.org/10.13189/ms.2022.100119>.
- Botha, N. *et al.* (2021) 'Statistical Design of Experiments: An introductory case study for polymer composites manufacturing applications', *MATEC Web of Conferences*, 347, p. 00028. Available at: <https://doi.org/10.1051/mateconf/202134700028>.
- Canbolat, A.S. *et al.* (2019) 'Performance optimization of absorption refrigeration systems using Taguchi, ANOVA and Grey Relational Analysis methods', *Journal of Cleaner Production*, 229, pp. 874–885. Available at: <https://doi.org/10.1016/j.jclepro.2019.05.020>.

- Chen, J. *et al.* (2020) ‘Superelastic, Sensitive, and Low Hysteresis Flexible Strain Sensor Based on Wave-Patterned Liquid Metal for Human Activity Monitoring’, *ACS Applied Materials & Interfaces*, 12(19), pp. 22200–22211. Available at: <https://doi.org/10.1021/acsami.0c04709>.
- Chen, Y. *et al.* (2024) ‘Design–material transition threshold of ribbon kirigami’, *Materials & Design*, 242, p. 112979. Available at: <https://doi.org/10.1016/j.matdes.2024.112979>.
- Chittibabu, S.K. and Chintagumpala, K. (2023) ‘Evolution of 2D materials conducive to the wearable physical sensors for structural health assessment’, *Microelectronic Engineering*, 276, p. 112013. Available at: <https://doi.org/10.1016/j.mee.2023.112013>.
- Chow, L. *et al.* (2024) ‘Soft, body conformable electronics for thermoregulation enabled by kirigami’, *Bio-Design and Manufacturing*, 7(4), pp. 453–462. Available at: <https://doi.org/10.1007/s42242-024-00290-6>.
- Christ, J.F. *et al.* (2018) ‘Bidirectional and Stretchable Piezoresistive Sensors Enabled by Multimaterial 3D Printing of Carbon Nanotube/Thermoplastic Polyurethane Nanocomposites’, *Polymers*, 11(1), p. 11. Available at: <https://doi.org/10.3390/polym11010011>.
- Daneshzand, F., Perin, C. and Carpendale, S. (2022) ‘KiriPhys: Exploring New Data Physicalization Opportunities’, *IEEE Transactions on Visualization and Computer Graphics*, pp. 1–11. Available at: <https://doi.org/10.1109/TVCG.2022.3209365>.
- Dwornicka, R. and Pietraszek, J. (2018) ‘The outline of the expert system for the design of experiment’, *Production Engineering Archives*, 20(20), pp. 43–48. Available at: <https://doi.org/10.30657/pea.2018.20.09>.
- Elgeneidy, K. *et al.* (2018) ‘Directly Printable Flexible Strain Sensors for Bending and Contact Feedback of Soft Actuators’, *Frontiers in Robotics and AI*, 5. Available at: <https://doi.org/10.3389/frobt.2018.00002>.
- Equbal, A. *et al.* (2024) ‘A recent review on advancements in dimensional accuracy in fused deposition modeling (FDM) 3D printing’, *AIMS Materials Science*, 11(5), pp. 950–990. Available at: <https://doi.org/10.3934/matensci.2024046>.
- Fein, E.C. *et al.* (2022) *Section 6.2: One-Way ANOVA Assumptions, Interpretation, and Write up.* <https://usq.pressbooks.pub/statisticsforresearchstudents/chapter/one-way-anova-assumptions/>.
- Firmino, A.S. *et al.* (2020) ‘Towards Industry 4.0: a SWOT-based analysis for companies located in the Sorocaba Metropolitan Region (São Paulo State, Brazil)’, *Gestão & Produção*, 27(3). Available at: <https://doi.org/10.1590/0104-530x5622-20>.
- Grosso, B.F. and Mele, E.J. (2020) ‘Graphene gets bent’, *Physics Today*, 73(9), pp. 46–52. Available at: <https://doi.org/10.1063/PT.3.4569>.
- Gu, J. *et al.* (2024) ‘Auxetic kirigami structure-based self-powered strain sensor with customizable performance using machine learning’, *Nano Energy*, 130, p. 110124. Available at: <https://doi.org/10.1016/j.nanoen.2024.110124>.

- Guo, J. *et al.* (2023) 'Kirigami-Inspired 3D Printable Soft Pneumatic Actuators with Multiple Deformation Modes for Soft Robotic Applications', *Soft Robotics*, 10(4), pp. 737–748. Available at: <https://doi.org/10.1089/soro.2021.0199>.
- Hamilton, D.F., Ghert, M. and Simpson, A.H.R.W. (2015) 'Interpreting regression models in clinical outcome studies', *Bone & Joint Research*, 4(9), pp. 152–153. Available at: <https://doi.org/10.1302/2046-3758.49.2000571>.
- Han, F. *et al.* (2021) 'Materials, Electrical Performance, Mechanisms, Applications, and Manufacturing Approaches for Flexible Strain Sensors', *Nanomaterials*, 11(5), p. 1220. Available at: <https://doi.org/10.3390/nano11051220>.
- Han, X. *et al.* (2021) 'Effect of Elasticity on Electrical Properties of Weft-Knitted Conductive Fabrics', *Fibres and Textiles in Eastern Europe*, 29(1(145)), pp. 47–52. Available at: <https://doi.org/10.5604/01.3001.0014.5042>.
- Hasan, T. and Hussain, S.A. (2022) 'I-optimal Designs for three and four component mixture models in orthogonal blocks', *Pakistan Journal of Statistics and Operation Research*, pp. 943–954. Available at: <https://doi.org/10.18187/pjsor.v18i4.3369>.
- Hisam, M.W. *et al.* (2024) 'The Versatility of the Taguchi Method: Optimizing Experiments Across Diverse Disciplines', *Journal of Statistical Theory and Applications*, 23(4), pp. 365–389. Available at: <https://doi.org/10.1007/s44199-024-00093-9>.
- Jagadeesan, S. *et al.* (2024) 'Investigating the Effects of Nozzle Diameter Variation on Additive Manufacturing', 11.
- Javaid, M. *et al.* (2021) 'Significance of sensors for industry 4.0: Roles, capabilities, and applications', *Sensors International*, 2, p. 100110. Available at: <https://doi.org/10.1016/j.sintl.2021.100110>.
- Jo, M. *et al.* (2019) '3D Printer-Based Encapsulated Origami Electronics for Extreme System Stretchability and High Areal Coverage', *ACS Nano*, 13(11), pp. 12500–12510. Available at: <https://doi.org/10.1021/acsnano.9b02362>.
- Jones, B. and Goos, P. (2012) 'I-Optimal Versus D-Optimal Split-Plot Response Surface Designs', *Journal of Quality Technology*, 44(2), pp. 85–101. Available at: <https://doi.org/10.1080/00224065.2012.11917886>.
- Kim, T.-H., Moeinnia, H. and Kim, W.S. (2023) '3D printed vorticella-kirigami inspired sensors for structural health monitoring in Internet-of-Things', *Materials & Design*, 234, p. 112332. Available at: <https://doi.org/10.1016/j.matdes.2023.112332>.
- Kim, Y.-G. *et al.* (2022) 'Piezoelectric strain sensor with high sensitivity and high stretchability based on kirigami design cutting', *npj Flexible Electronics*, 6(1), p. 52. Available at: <https://doi.org/10.1038/s41528-022-00186-4>.
- Kumar, S. *et al.* (2024) 'A comprehensive review of FDM printing in sensor applications: Advancements and future perspectives', *Journal of Manufacturing Processes*, 113, pp. 152–170. Available at: <https://doi.org/10.1016/j.jmapro.2024.01.030>.
- Lei, Q.E. *et al.* (2023) 'Design and characterize of kirigami-inspired springs and the application in vertebrae exoskeleton for adolescent idiopathic scoliosis

- brace treatment’, *Frontiers in Mechanical Engineering*, 9. Available at: <https://doi.org/10.3389/fmech.2023.1152930>.
- Li, B. *et al.* (2022) ‘Strain sensing behavior of FDM 3D printed carbon black filled TPU with periodic configurations and flexible substrates’, *Journal of Manufacturing Processes*, 74, pp. 283–295. Available at: <https://doi.org/10.1016/j.jmapro.2021.12.020>.
- Li, H. *et al.* (2020) ‘A Supersensitive, Multidimensional Flexible Strain Gauge Sensor Based on Ag/PDMS for Human Activities Monitoring’, *Scientific Reports*, 10(1), p. 4639. Available at: <https://doi.org/10.1038/s41598-020-61658-z>.
- Luo, X. *et al.* (2024) ‘Multi-walled carbon nanotube-enhanced polyurethane composite materials and the application in high-performance 3D printed flexible strain sensors’, *Composites Science and Technology*, 257, p. 110818. Available at: <https://doi.org/10.1016/j.compscitech.2024.110818>.
- Machery, E. (2020) ‘What Is a Replication?’, *Philosophy of Science*, 87(4), pp. 545–567. Available at: <https://doi.org/10.1086/709701>.
- Medellin-Castillo, H.I. and Zaragoza-Siqueiros, J. (2019) ‘Design and Manufacturing Strategies for Fused Deposition Modelling in Additive Manufacturing: A Review’, *Chinese Journal of Mechanical Engineering*, 32(1), p. 53. Available at: <https://doi.org/10.1186/s10033-019-0368-0>.
- Myers, R.H., Montgomery, D.C. and Anderson-Cook, C.M. (2009) *RESPONSE SURFACE METHODOLOGY*. 3rd edn. Wiley.
- Nakajima, J., Fayazbakhsh, K. and Teshima, Y. (2020) ‘Experimental study on tensile properties of 3D printed flexible kirigami specimens’, *Additive Manufacturing*, 32, p. 101100. Available at: <https://doi.org/10.1016/j.addma.2020.101100>.
- Nawaz, A. *et al.* (2025) ‘Preparation, and Characterization of Solar Light-Triggered Perovskites and Their Photocatalytic Applications Toward Contaminated Water Optimized and Validated by Box-Behnken Design of Experimentation’, *Nano* [Preprint]. Available at: <https://doi.org/10.1142/S1793292025500353>.
- Nazlabadi, E., Niaragh, E.K. and Moghaddam, M.R.A. (2021) ‘A systematic and critical review of two decades’ application of response surface methodology in biological wastewater treatment processes’, *Desalination and Water Treatment*, 228, pp. 92–120. Available at: <https://doi.org/10.5004/dwt.2021.27315>.
- Ngo, T.D. *et al.* (2018) ‘Additive manufacturing (3D printing): A review of materials, methods, applications and challenges’, *Composites Part B: Engineering*, 143, pp. 172–196. Available at: <https://doi.org/10.1016/j.compositesb.2018.02.012>.
- Peng, S. *et al.* (2023) ‘Vat photopolymerization 3D printing of transparent, mechanically robust, and self-healing polyurethane elastomers for tailored wearable sensors’, *Chemical Engineering Journal*, 463, p. 142312. Available at: <https://doi.org/10.1016/j.cej.2023.142312>.
- Lo Presti, D. *et al.* (2024) ‘Optimization and characterization of a 3D-printed wearable strain sensor for respiration and heartbeat measurements’,

- Measurement*, 228, p. 114377. Available at: <https://doi.org/10.1016/j.measurement.2024.114377>.
- Roudi, A.M. *et al.* (2021) ‘Response Surface Methodology (RSM)-Based Prediction and Optimization of the Fenton Process in Landfill Leachate Decolorization’, *Processes*, 9(12), p. 2284. Available at: <https://doi.org/10.3390/pr9122284>.
- Rukhsana, D., Ramli, N.A. and Nordin, A.N. (2021) ‘Development of Low-Cost, Kirigami-inspired, Stretchable on Skin Strain Sensors using Tattoo Paper’, in *2021 IEEE 7th International Conference on Smart Instrumentation, Measurement and Applications (ICSIMA)*. IEEE, pp. 146–151. Available at: <https://doi.org/10.1109/ICSIMA50015.2021.9525944>.
- Saikumar, P., Sammaiah, P. and Bhavar, V. (2024) ‘Design a process to reduce the tolerance for FDM process’, in, p. 040039. Available at: <https://doi.org/10.1063/5.0196103>.
- Sastry, G. *et al.* (2024) ‘Computing Power and the Governance of Artificial Intelligence’.
- Shahub, S. *et al.* (2022) ‘Machine learning guided electrochemical sensor for passive sweat cortisol detection’, *Sensing and Bio-Sensing Research*, 38, p. 100527. Available at: <https://doi.org/10.1016/j.sbsr.2022.100527>.
- Shen, Z. *et al.* (2022) ‘Progress of flexible strain sensors for physiological signal monitoring’, *Biosensors and Bioelectronics*, 211, p. 114298. Available at: <https://doi.org/10.1016/j.bios.2022.114298>.
- Shu, J. *et al.* (2023) ‘Effects of Slit Edge Notches on Mechanical Properties of 3D-Printed PA12 Nylon Kirigami Specimens’, *Polymers*, 15(14), p. 3082. Available at: <https://doi.org/10.3390/polym15143082>.
- Shukla, V. V *et al.* (2019) *THERMAL ANALYSIS OF 3-D PRINTER LIQUEFIER INDICATES A PROBABLE CAUSE OF NOZZLE CLOGGING*. Available at: www.tjprc.org.
- Singh, S. *et al.* (2018) ‘Effect of Process Parameters on Shrinkage of Acrylonitrile Butadiene Styrene Parts Fabricated by 3D Printing Process’, in, pp. 109–118. Available at: https://doi.org/10.1007/978-3-319-78919-4_9.
- Song, J. *et al.* (2023) ‘Stretchable Strain and Strain Rate Sensor Using Kirigami - Cut PVDF Film’, *Advanced Materials Technologies*, 8(6). Available at: <https://doi.org/10.1002/admt.202201112>.
- Sreevanya, G.V. *et al.* (2024) ‘Highly stretchable and flexible kirigami patterned silver electrodes for wearable electronics’, *Sensors and Actuators A: Physical*, 378, p. 115813. Available at: <https://doi.org/10.1016/j.sna.2024.115813>.
- Sun, Y. *et al.* (2021) ‘Geometric design classification of kirigami-inspired metastructures and metamaterials’, *Structures*, 33, pp. 3633–3643. Available at: <https://doi.org/10.1016/j.istruc.2021.06.072>.
- Ben Taher, M.A. *et al.* (2023) ‘A novel design to optimize the optical performances of parabolic trough collector using Taguchi, ANOVA and grey relational analysis methods’, *Renewable Energy*, 216, p. 119105. Available at: <https://doi.org/10.1016/j.renene.2023.119105>.

- Tientcheu, S.W.T. *et al.* (2024) ‘A review on fused deposition modeling materials with analysis of key process parameters influence on mechanical properties’, *The International Journal of Advanced Manufacturing Technology*, 130(5–6), pp. 2119–2158. Available at: <https://doi.org/10.1007/s00170-023-12823-x>.
- Ullah Jan, A. *et al.* (no date) *LOGRITHMIC TRANSFORMATION: A TOOL FOR NORMALIZING RESIDUALS IN ANOVA MODELS*.
- Uy, M. and Telford, J.K. (2009) ‘Optimization by Design of Experiment techniques’, in *2009 IEEE Aerospace conference*. IEEE, pp. 1–10. Available at: <https://doi.org/10.1109/AERO.2009.4839625>.
- Vanraj, Dharmi, S.S. and Pabla, B.S. (2017) ‘Optimization of sound sensor placement for condition monitoring of fixed-axis gearbox’, *Cogent Engineering*, 4(1), p. 1345673. Available at: <https://doi.org/10.1080/23311916.2017.1345673>.
- Veza, I. *et al.* (2023) ‘Response surface methodology (RSM) for optimizing engine performance and emissions fueled with biofuel: Review of RSM for sustainability energy transition’, *Results in Engineering*, 18, p. 101213. Available at: <https://doi.org/10.1016/j.rineng.2023.101213>.
- Wang, H. *et al.* (2021) ‘Laser-induced porous graphene on Polyimide/PDMS composites and its kirigami-inspired strain sensor’, *Theoretical and Applied Mechanics Letters*, 11(2), p. 100240. Available at: <https://doi.org/10.1016/j.taml.2021.100240>.
- Wang, Y., Ma, Y. and Carroll, R.J. (2009) ‘Variance Estimation in the Analysis of Microarray Data’, *Journal of the Royal Statistical Society Series B: Statistical Methodology*, 71(2), pp. 425–445. Available at: <https://doi.org/10.1111/j.1467-9868.2008.00690.x>.
- Wang, Z. *et al.* (2023) ‘Kirigami–Origami-Inspired Lead-Free Piezoelectric Ceramics’, *Advanced Science*, 10(17). Available at: <https://doi.org/10.1002/advs.202207059>.
- Xia, J. *et al.* (2023) ‘Stretchable and Sensitive Strain Sensors Based on CB/MWCNTs–TPU for Human Motion Capture and Health Monitoring’, *ACS Applied Nano Materials*, 6(11), pp. 9736–9745. Available at: <https://doi.org/10.1021/acsnm.3c01447>.
- Yadla, L.L. *et al.* (2023) ‘Smart Manufacturing In Industries Using Internet Of Things’, in *2023 International Conference on Computer Communication and Informatics (ICCCI)*. IEEE, pp. 1–5. Available at: <https://doi.org/10.1109/ICCCI56745.2023.10128206>.
- Yong, K. *et al.* (2020) ‘Kirigami-inspired strain-insensitive sensors based on atomically-thin materials’, *Materials Today*, 34, pp. 58–65. Available at: <https://doi.org/10.1016/j.mattod.2019.08.013>.
- Zhou, X. *et al.* (2020) ‘All 3D-printed stretchable piezoelectric nanogenerator with non-protruding kirigami structure’, *Nano Energy*, 72, p. 104676. Available at: <https://doi.org/10.1016/j.nanoen.2020.104676>.
- Zhuo, F. *et al.* (2023) ‘Kirigami-Inspired 3D-Printable MXene Organohydrogels for Soft Electronics’, *Advanced Functional Materials*, 33(52). Available at: <https://doi.org/10.1002/adfm.202308487>.

Zulkifli, M.Z. *et al.* (2024) 'Carbon conductive coated fiber Bragg grating sensor for voltage detection', *Journal of Optoelectronics and Advanced Materials*, 26.