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| **Title:** | Production of 3D Printing Filament from Recycled Plastic Bottles using Fused Deposition Modeling | | |
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| **Published Journal Name:** | 4th International Conference on Robotics, Electrical and Signal Processing Techniques (ICREST 2025) | | |
| **Type of Publication:** | International Conference | | |
| **Volume:** |  | Issue |  |
| **Publisher:** | IEEE | | |
| **Publication Date:** | Jan 11-12, 2025 | | |
| **ISSN:** | 2169-8767 | | |
| **DOI:** |  | | |
| **URL:** | https://icrest.aiub.edu | | |
| **Other Related Info.:** | Page ID 57 | | |
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| **Abstract:** |  |
| This study focuses on establishing a sustainable and innovative approach to recycling low-density polyethylene (LDPE) derived from waste plastic bottles. The release of millions of tons of waste plastic into landfills, oceans, and ecosystems around the globe has resulted in plastic pollution as a global environmental crisis. The capital city Dhaka in Bangladesh sees over 600 tons of plastic waste every single day of which less than 36 percent are reused. This study focuses on recycling these plastics into high quality filament materials that can be used for 3D printing. Fused deposition modeling (FDM) is used for making the filament from waste plastic bottles. The study involves various processes such as collecting and sorting LDPE, shredding, washing, drying, melting, extrusion, and quality control measures to ensure the produced filament meets the required standards. Special attention is given to color variation, adaptability to different 3D printers, and the promotion of environmental benefits by complying with the global sustainability goals (SDGs). As the first of its kind in Bangladesh, the study shows the way to not only lessen the burden of plastic trash but also produce handy products and foster a circular economy. | |