

Textile Wastes: A Traditional Method for Handling and Potential Rewards from Artificial Intelligence Application

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Opinion

Artificial Intelligence (AI) is, currently, the main topic all over the world, and when used properly, it can achieve human prosperity.

The integration of judgment AI in the textile industry is powering significant progressions across different fields, including manufacturing, design, quality control, and sustainability. The application of AI technologies, like machine acquiring, computer vision, and predictive analytics, will transform traditional processes to enhance efficiency, reduce waste, and offer innovative solutions for smart textiles and wearable technology. The application of automation in each field of the textile industry is improving production workflows. This can be achieved through improving the powered quality control, which guarantees higher accuracy in defect detection and fabric inspection. Additionally, it is facilitating extrapolative analytics in supply chains, assisting manufacturers in estimating demand and managing resources more efficiently. The AI can participate a crucial role in sustainable textiles, through supporting eco-friendly practices by minimizing waste, elevating resource efficiency, and enabling circular fashion. In spite of its transformative capability, AI application presents challenges, such as ethical concerns, data quality, and integration with traditional systems.

The most challenging subject that should be presented in the application of AI in the textile industry is the handling of the generated waste.

One of the topics that falls within the scope of the general problem of management of accumulated solid wastes originating from the textile industry, especially those coming from the spinning process, was studied practically [1]. Application of recycled textile wastes in cement materials is an experimental study that involves searches for the treatment of spinney wastes based on wet oxidative degradation technique. The resulting slurry from degradation treatment was used as reinforcement for mortar composite product. The work includes four main subjects, (a) Partial degradation of the cellulosic spinney wastes before incorporation into mortar materials, (b) mechanical, physical and structural characterizations of the reached composite, (c) evaluation of the add-value composite under some selected circumstances like frost and chemical attacks and (d) rational approach for producing some mortar composite tiles that can be applied in the construction field [2].

With its comprehensive coverage and systematic presentation, this work would be a useful study for chemists, environmentalists, and engineers. Furthermore, it can be a valuable reference for science and engineering students at various levels [3]. It can also be a basis for the current trends, applications, and future directions of AI in textiles, emphasizing its fundamental part in reforming the industry's future.

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