

How algorithms can help the clothing industry

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Can big data and artificial intelligence (AI) improve the clothing industry's value chains, adapt products to customer needs, and help the industry keep up with how customer needs are evolving? Sheenam Jain, doctoral student in the SMDTex program, has examined this in her thesis.

When she began her doctoral studies, it was with the aim of developing a larger system—a complete solution—that could be integrated with several data sources and models, which in turn could help to personalize garments. But a bit into her research studies, she realized that it would take more than four years and a single researcher to achieve this.

"I had to face several challenges that most of the new researchers face: I wrote my first scientific article, I got my first rejection from a [scientific journal](#), I learned to understand the field of research, and to reduce the scope of my research," explains Sheenam Jain.

The new goal of her thesis was to understand the importance of [big data](#) and [artificial intelligence](#) in the clothing industry and, based on that, to find

ways for companies in the industry to gain competitive advantages. This would also contribute to society through greener production and consumption.

"I have discovered that there are generally little focus in the clothing industry to apply AI on data from products and customers. That's why I've developed two models to create data-driven solutions that can help create products closer to customers' specific needs," she says.

The first [model](#) is a clothing classification framework developed through four machine learning techniques. To find the best algorithm, Sheenam Jain made calculations based on how well they performed. The algorithm "random forest" worked best.

"This type of model can be used to establish standard semantic ontologies and/or integrated with the existing recommendation systems."

The second model was a decision support system that she developed through the AI technique "fuzzy logic." This solution helps the company choose the most appropriate fabric depending on the needs of the user.

"This type of model can be integrated with product configurators and/or used internally by the product development department to provide customized garments."

Finally, through her thesis, clothing retailers can have a model that can help them manage big data in order to provide customers with personalized services.

Sheenam Jain has been a doctoral student in the Erasmus mundus joint doctoral program Sustainable Management and Design of Textiles (SMDtex) funded by the European Union. This means that she has conducted research within

three specializations (automation, textile management, and textile engineering), at three universities, and in three countries (France, Sweden, and China).

She used various methods to collect data—literature reviews, surveys, interviews, and open source databases.

"It has been complicated to bring perspectives from the three areas into my research. But it has also been very interesting to work in an interdisciplinary project as it has increased my ability to look at a problem from different viewpoints," says Sheenam Jain.

"It has also been very interesting to conduct research at three different universities. I learned the differences in philosophy in different countries, institutions, and disciplines. It has given me the ability to adapt to change faster and has developed my way of communicating and networking, as well as my intercultural skills."

Now that her doctoral studies have been completed, she is considering her opportunities when it comes to continuing to work in academia or industry.

"My focus is to find something that requires a synergy between management and technology. I could also imagine starting my own business either within analytical solutions or circular fashion."

More information: Big Data Management Using Artificial Intelligence in the Apparel Supply Chain: Opportunities and Challenges.

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