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Transformative ways to study transformative bioeconomies

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Domain: Textiles with a focus on cotton

What are you exploring? With what objective?

We **challenge** the **existing** simulation and prediction **approaches in adopting new information** by **confronting** them with **machine-learning** techniques. In doing so, we aim to **develop** a **methodology** that benefits the **reliability** of simulation, forecast assessments of **leverage points**, and **intervention analyses**.

Why is this interesting scientifically?

The **developed methodology**:

- provides a novel generic framework that enables **quick evaluation and remediation** of the forecasts and/or simulations based on parametric models or domain experts.
- closes the knowledge gap of scientifically integrating the parametric statistical models with non-parametric machine learning models through **model fusion**.
- is a semi-parametric tool (consisting of both parametric and non-parametric components), it, therefore, contributes to the stream of **explainable-artificial-intelligence** literature.

How is this relevant to the materials transition?

The developed methodology:
- provides a scientifically valid and practically efficient **tool** to engage **stakeholders** and **experts** in the **dialogue** of projecting the **future transition scenarios** for textile and building materials sectors.
- can be formulated as a **decision-support tool** that combines the knowledge of different experts, and parametric, and non-parametric approaches to **facilitate** informed **policy decisions** regarding the **bioeconomy transition**.
- will be used as **course material** in a new **MSc course** provided by WU-AEP on machine-learning time-series forecasting.

What are the key activities or steps?

- **Developing a methodology** that can be used to determine to what extent a specific approach (e.g. expert opinions, parametric models, etc.) is fast and flexible enough to adopt new information.
- **Organising a workshop** for **bioeconomy experts** in the textiles and building sectors to discuss the developed methodology
- **Upgrade the methodology** based on the workshop
- **Apply the methodology** to the selected **empirical case** of the workshop
- **Write a manuscript** about the results of the empirical case (we write the manuscript parallel to the empirical analysis)

What are key deliverables?

- An implementable **methodology**
- A **workshop**
- A **manuscript**

One what issues would you like to get input from others?

Can improvements be found in the way:
- our **models** captures new information?
- our **experts** absorb new information?
- our **data management systems** distribute new information?