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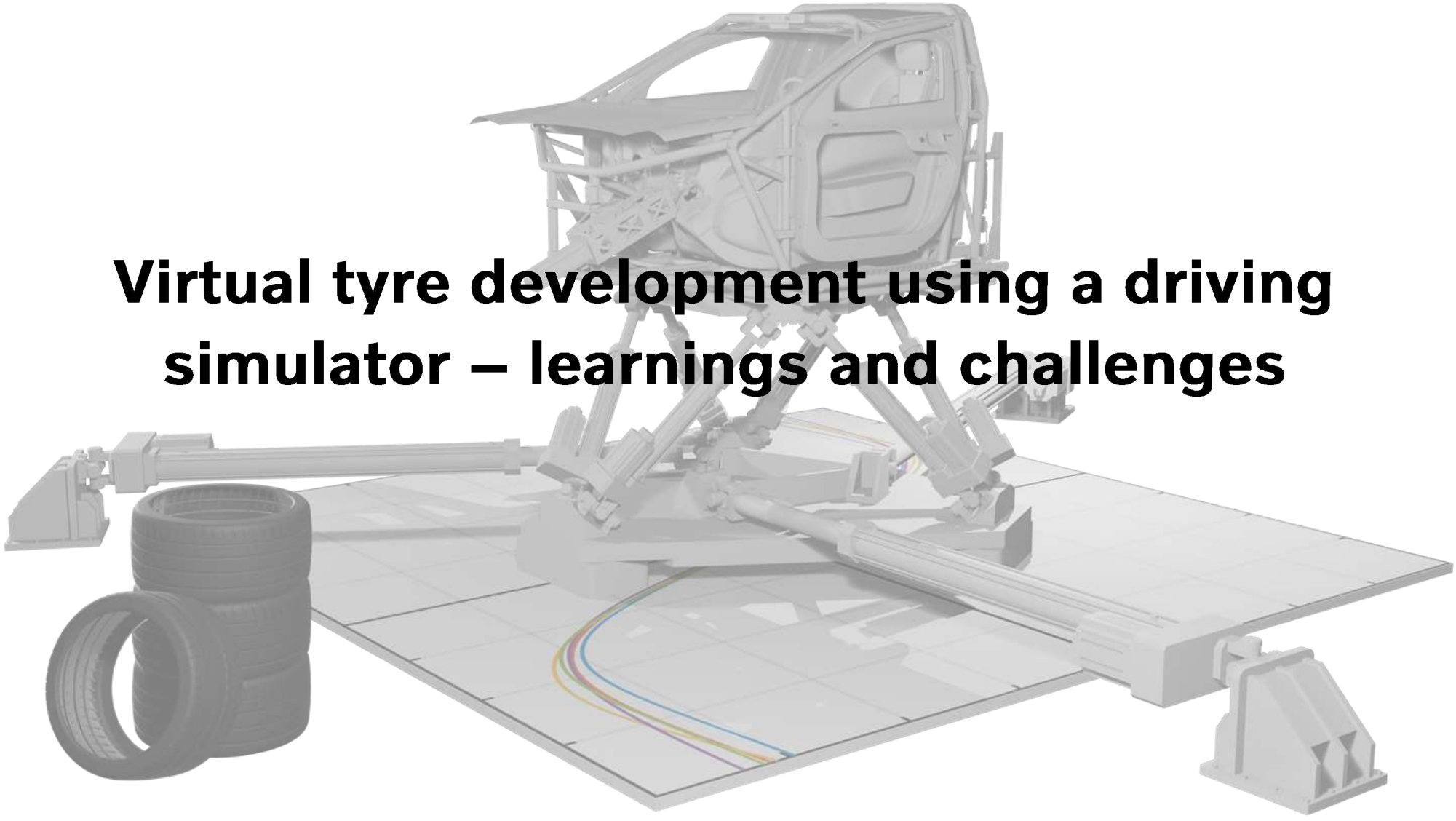
Virtual tyre development using a driving simulator – learnings and challenges



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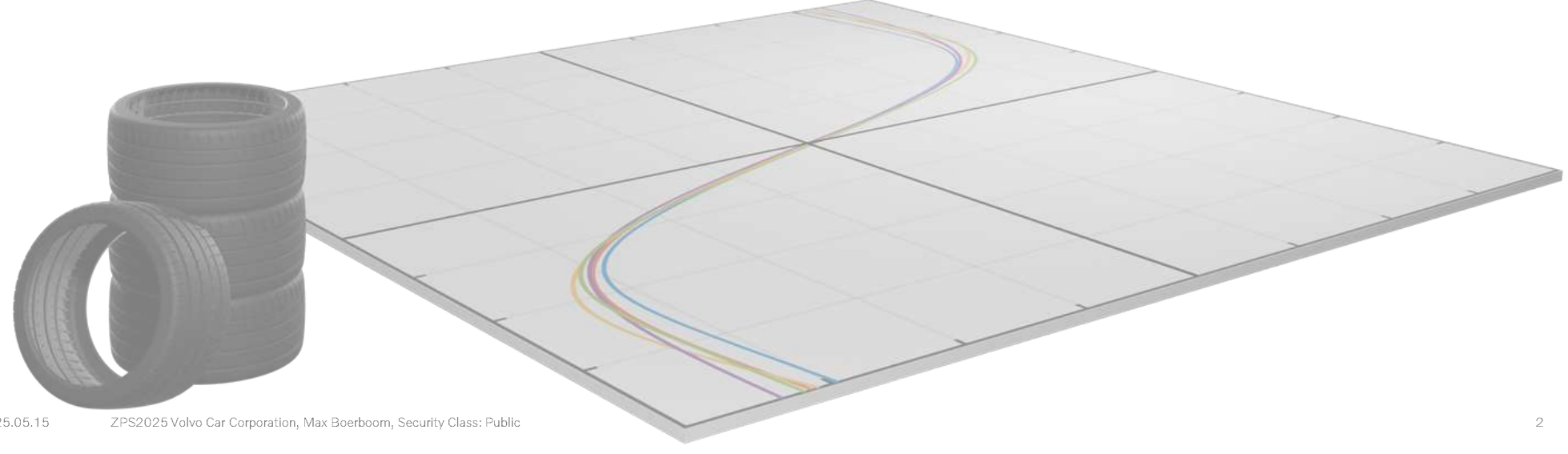

The start

- Tyre Modelling for Use in Vehicle Dynamics Studies
- The TYDEX workshop standardized;
  1. the interface between tyre measurements and tyre models.
  2. the interface between tyre models and vehicle models (STI).
- Magic Formula the standard for three decades in vehicle simulation.


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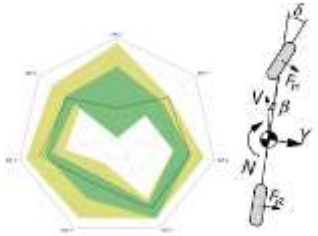
Tyre Modelling for Use in Vehicle Dynamics Studies

Egbert Bakker and Lars Nyborg

Hans B. Pacejka

Motivation



source:
Tyre and Vehicle Dynamics,
Hans B. Pacejka

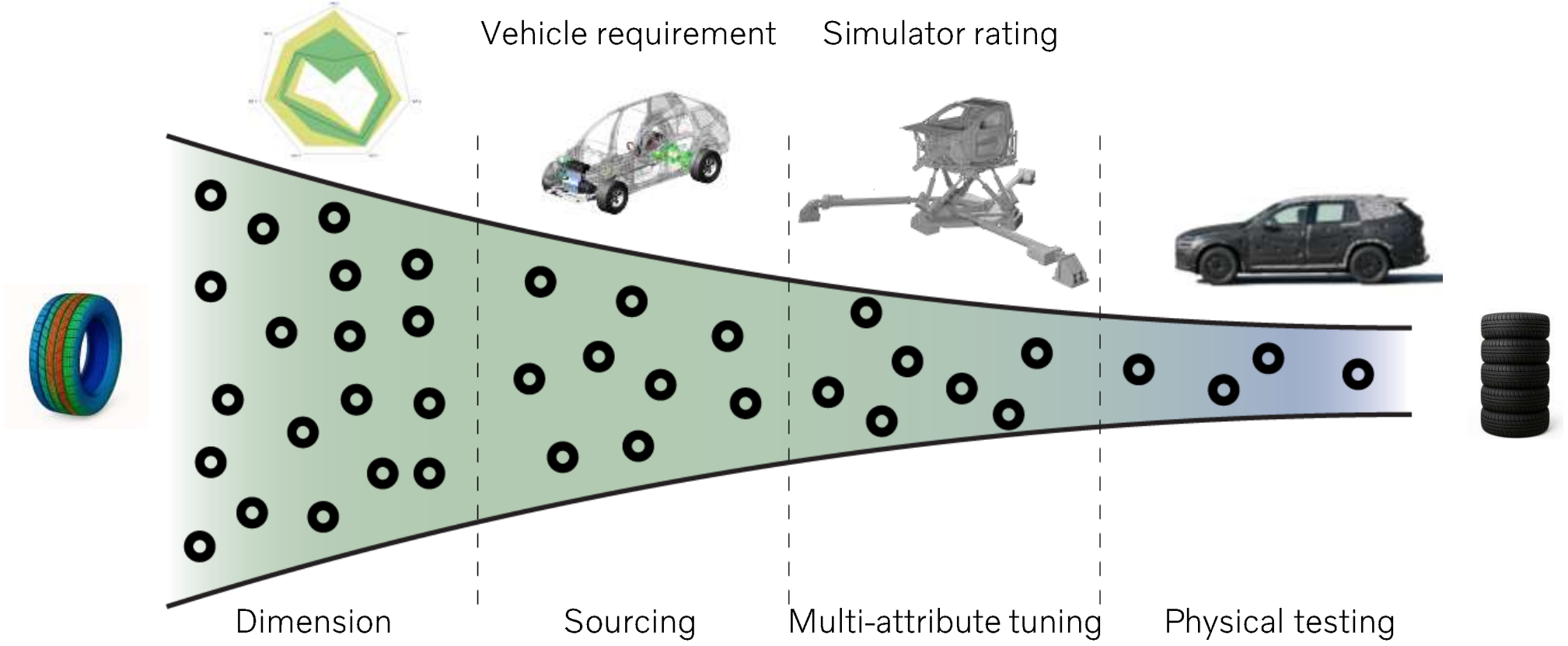
Concept → Chassis design → Prototype → Tyre tuning → Start of production

Virtual

Physical

±12 week loops

Methodology

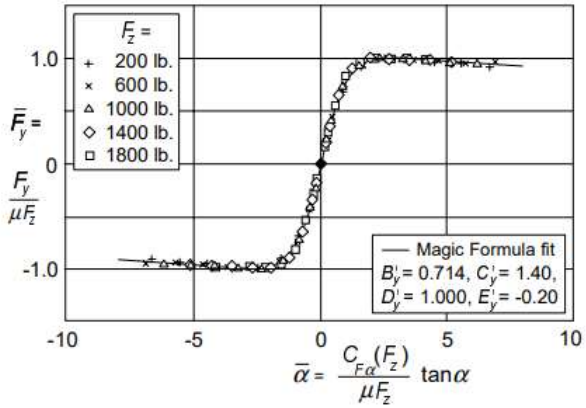


Process from the perspective of the OEM

source: ChatGPT

Blackbox

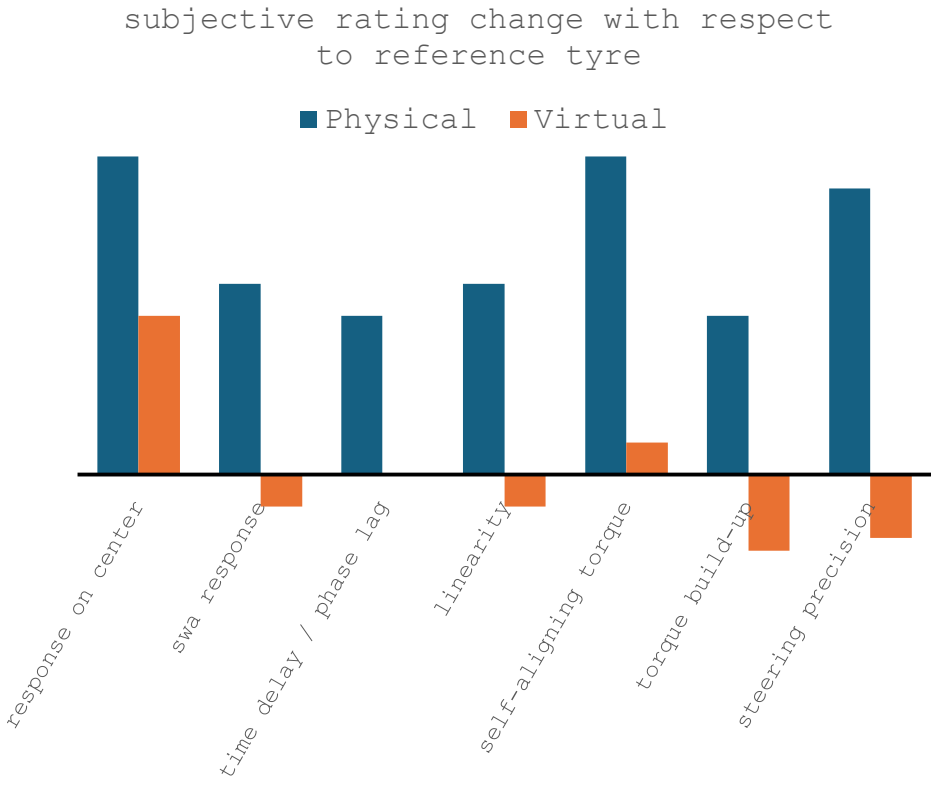
source: Tyre and Vehicle Dynamics, Hans B. Pacejka

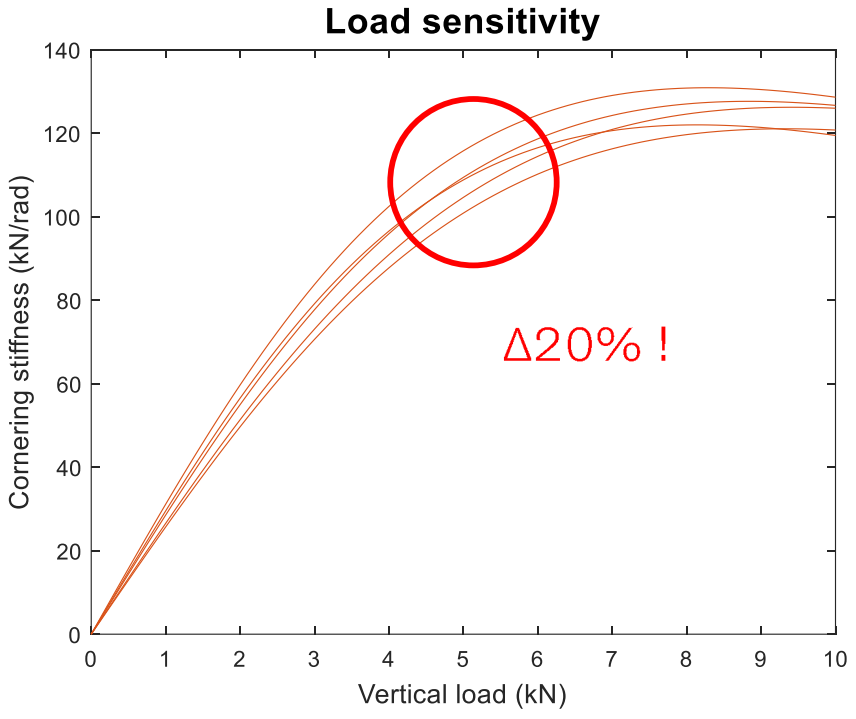


Physical tyre (or FE)

Virtual tyre

Problem



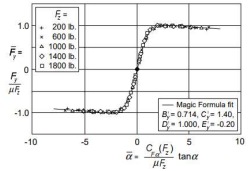


Process and sources of variation

source: ChatGPT

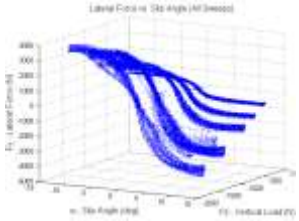
Conditioning before measurement → Measurement method → Data acquisition and filtering → Fitting

source:
Tyre and Vehicle Dynamics,
Hans B. Pacejka

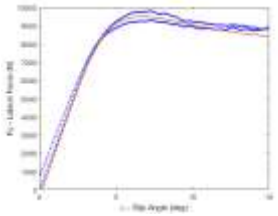


source: ChatGPT

source: mts.com

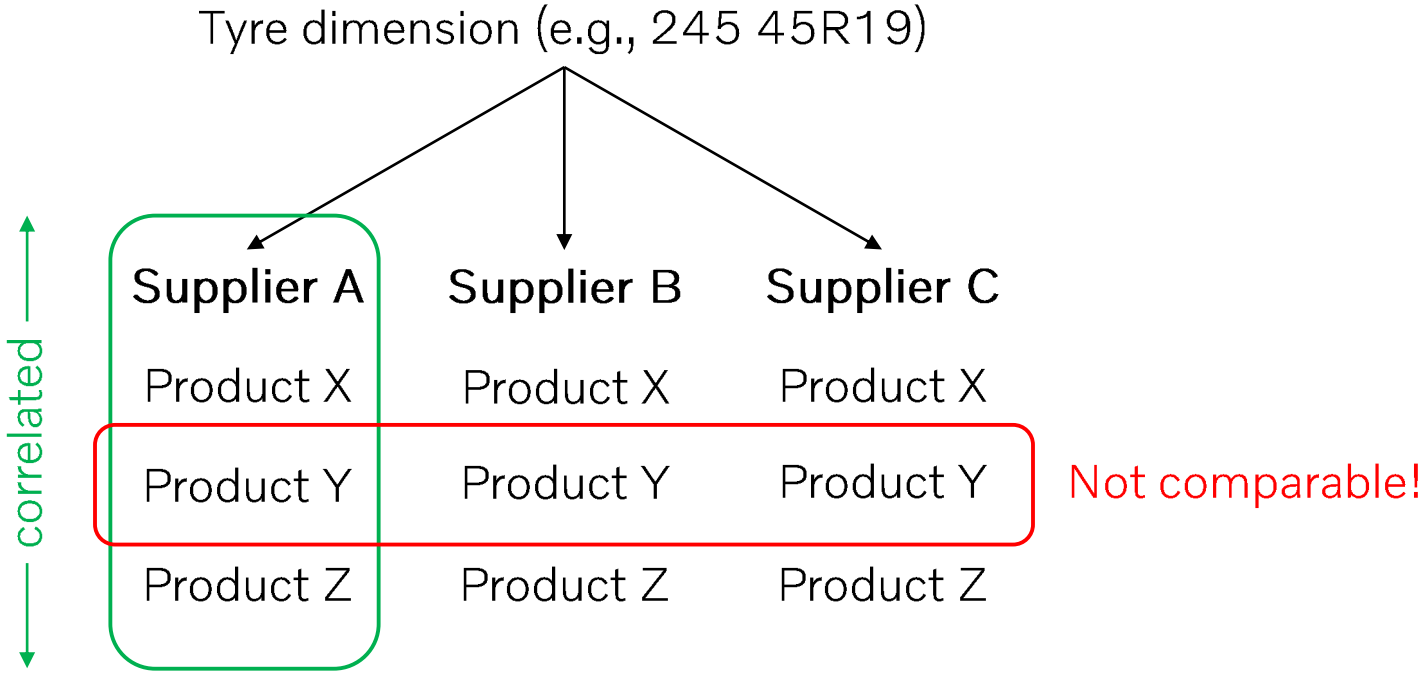


source: ResearchGate



source: Volvo Cars

A visioned industrial solution

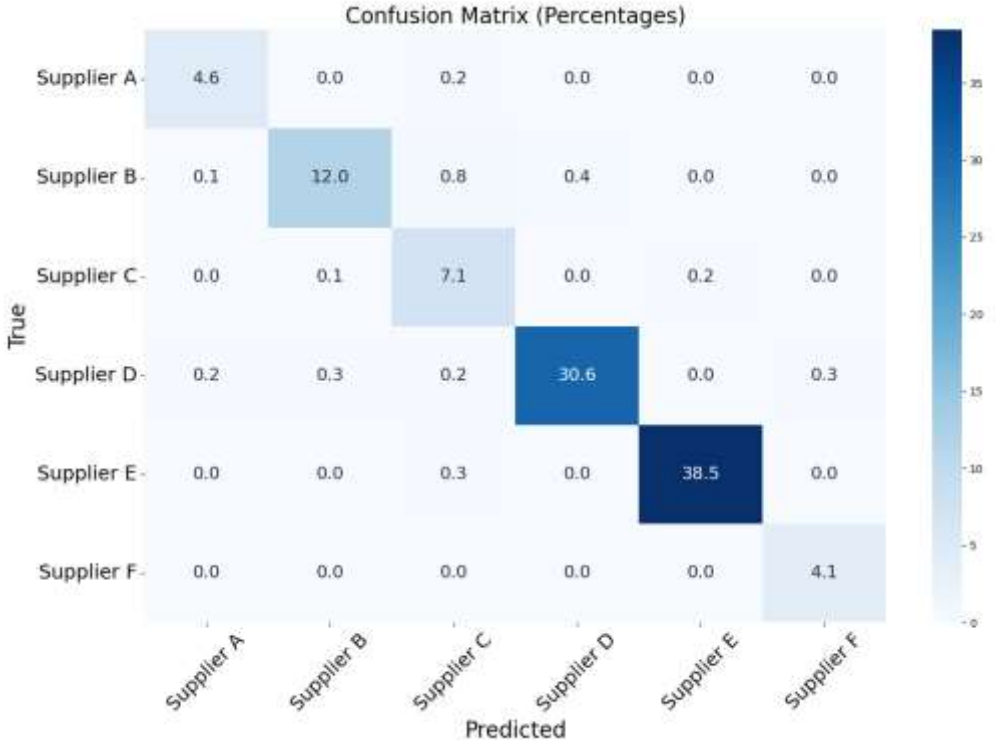


A visioned industrial solution

MSc Thesis;
“Machine Learning-Based Tire Model Optimization”

Joel Gråsjö

Kevin To



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