

AI for Engineering

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Michelin ? A mobility company that also build tires !



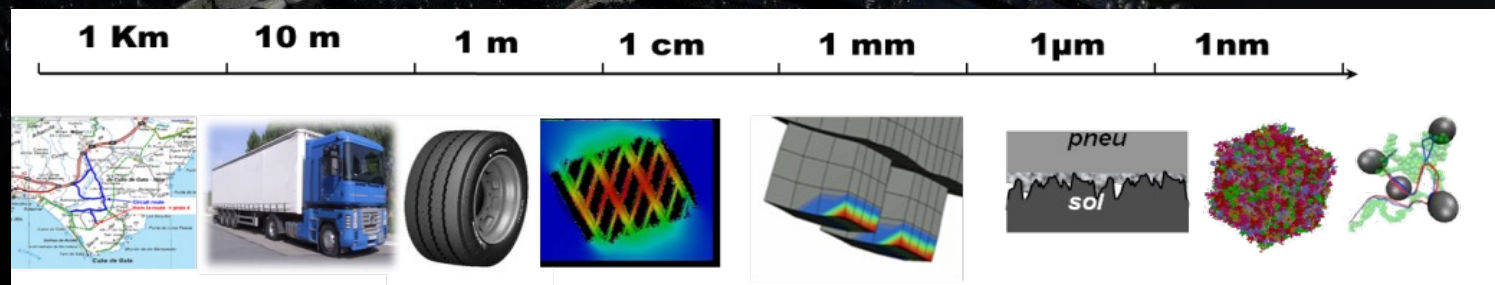
SIMULATION & DATA: FROM MOLECULE TO VEHICLE

Product performance

- virtual submission & virtual tire

Material conception levers

- optimize material recipe
- virtual material for simulation



Services & usage

- predictive maintenance
- real time condition assessment

Tire conception levers

Challenges for AI in Engineering

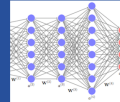
WE NEED TO MAKE SURE THEY ARE GOOD

WELL, GIVE ME A SOLUTION

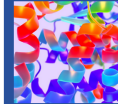
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Enable trust-worthy AI solutions for engineers
Through prediction uncertainty and
Exploitation domain assessment

Uncertainty & Coverage
Sensitivity
Online Learning
« *Model Audit platform* »



CERTIFICATION
EXPLAINABILITY



OPTIMIZATION
GENERATIVE

A need to quickly assess the best trade-off
inside a defined perimeter *exploitation*
or beyond *exploration*

Multi-objectives optimization
Generative Design : 3D, mat recipe

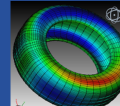
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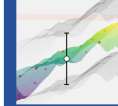
Small data
FEA synthetic data & ROM
Physically Informed

Use physics knowledge in AI
Toward hybrid simulation for
accuracy and acceleration

PRIOR & PHYSICS
KNOWLEDGE



UNCERTAINTY
QUANTIFICATION



Assess solutions robustness with respect
to real use uncertainty: manufacturing, usage,
to predict real life performance. Toward digital twin.

Parameter estimation
Inverse problem
Control
System Reliability

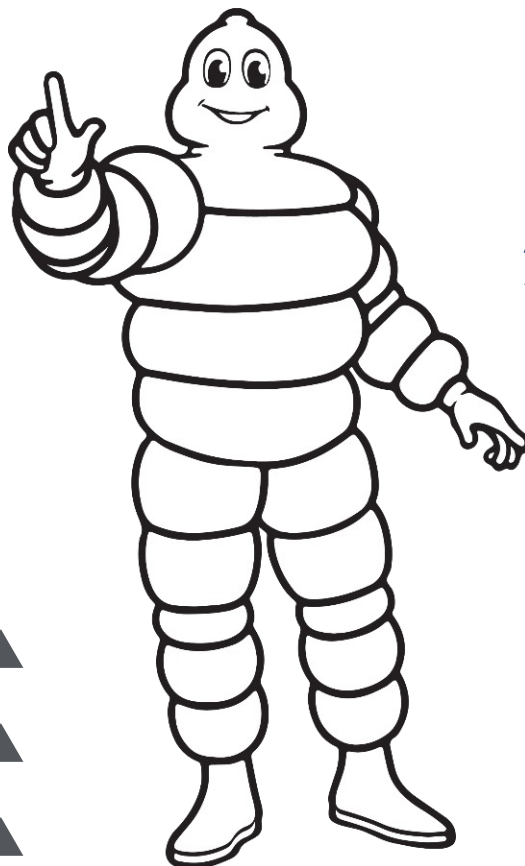
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WE NEED BETTER MODELS

IS-THIS TRUE ?



THANK YOU!



interested in feedback !
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