Galileo Ferraris

Galileo Ferraris' Contest

comparing *data-driven* methodologies for the *multi-physics* simulation of traction electrical machines

Awards Presentation

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Agenda of the GalFer Awards Presentation

13:00 Introduction to GalFer Contest

13:10 Address from Sponsors

- International Compumag Society
- Mathworks
- IEEE Magnetics Italy Chapter

13.20 Award Presentation for the three categories: Novelty, Interpolation, Extrapolation

13:40 address from Extrapolation winner

13:45 address from Interpolation winner

13:50 address from Novelty winner

13:55 Closure of the ceremony

approximate length of meeting 1 hour . . .

meeting is recorded and will be made available . . .

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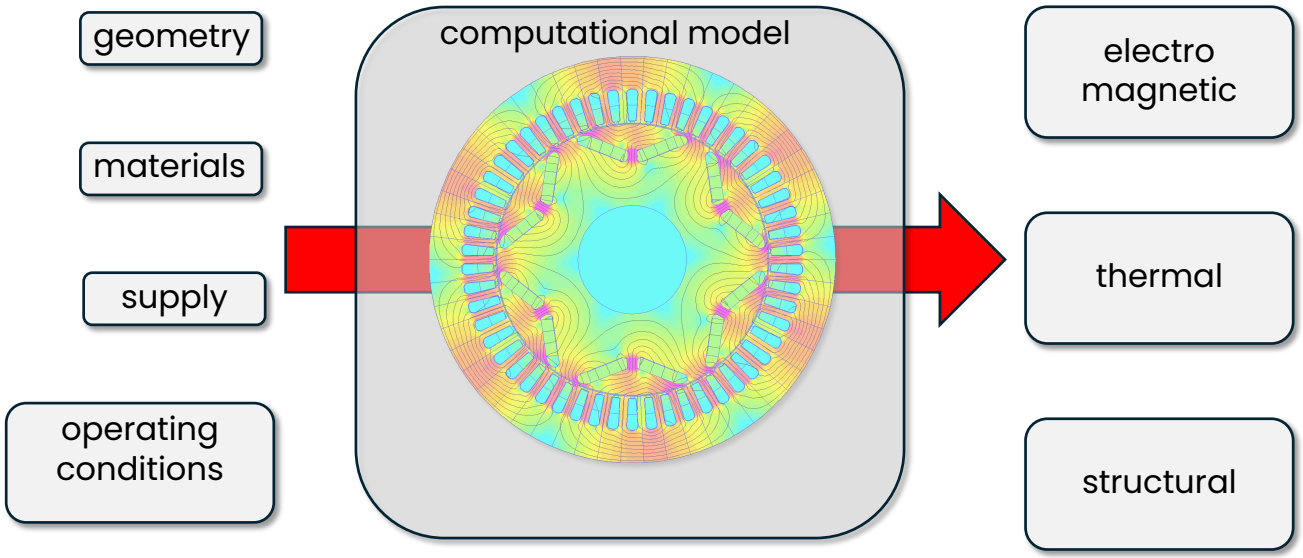
why electrical machine design is challenging?

- as their performance are *stretched* to the limit, traction motors are a complex *design challenge*
- new interactions across problem domains appear (electromagnetic, thermal, structural, acoustic, etc.) and require a *multi-physical* approach
- different criteria must be considered as well in the design process, and most often, these are *contrasting* each other as for:
  - torque and temperature
  - rotating speed and centrifugal stresses in rotor
  - mechanical stresses and torque
  - . . .
- *pre-design* and *optimization* tools become crucial due to more demanding constraints

Multi-physics model

Multi-physics model, from geometry to results



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why data-driven models?

- as *new requests* are made to designers, at the same time, new methodologies based on *learning from data* are appearing
- their pattern finding capabilities help a new approach to design and pre-design tools
- but how measuring the *effectiveness* of different *data-driven* procedures?
- whichever they are, all these procedures need a *training set of data* to be elaborated
- the proposal is *creating a reliable and open dataset of results* as a sandbox where different research groups can test their approaches

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