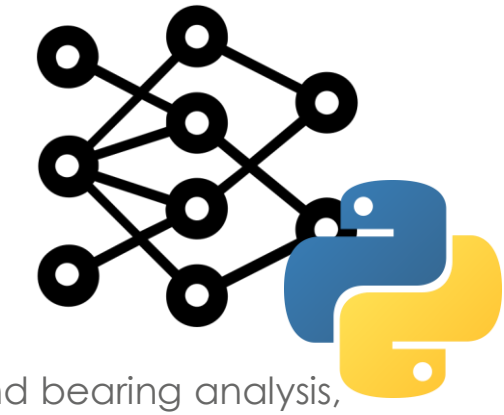
Data-driven coupling of GT-SUITE and AVL Excite for engine-mechanics digital-two applications

- Supporting companies: **GammaTech Engineering | DEUTZ**



- Start date: September/October 2026
- Project duration: 6÷8 months
- Site:
  - GTE's offices in Turin
- Motivations and Project Scope
  - DEUTZ uses two separate tools for mechanical analysis: AVL Excite for cranktrain, valvetrain and bearing analysis, GT-SUITE for engine performance and lubrication.
  - Each tool is the best accuracy/computational-time compromise for its own domain, but exchanging boundary conditions between the two today is manual and iterative.
  - This split toolchain is also the main obstacle to DEUTZ's broader goal: a unified digital twin across its engine portfolio.
- Thesis Proposal
  - This thesis will be structured in two steps:
    - Step 1

      Build a GUI based platform that eases boundary-condition exchange between GT-SUITE and AVL Excite, relying on a Python-based user interface. This will help to ensure the existence of one central, up-to-date, and documented location for all engine-related information.
    - Step 2

      Develop 0-D surrogate components via ML methods of the main bearings and connecting rod large end bearings AVL Excite models, to be inserted in the GT-SUITE lubrication circuit model. This will improve the model accuracy for pump sizing and early design assessment.