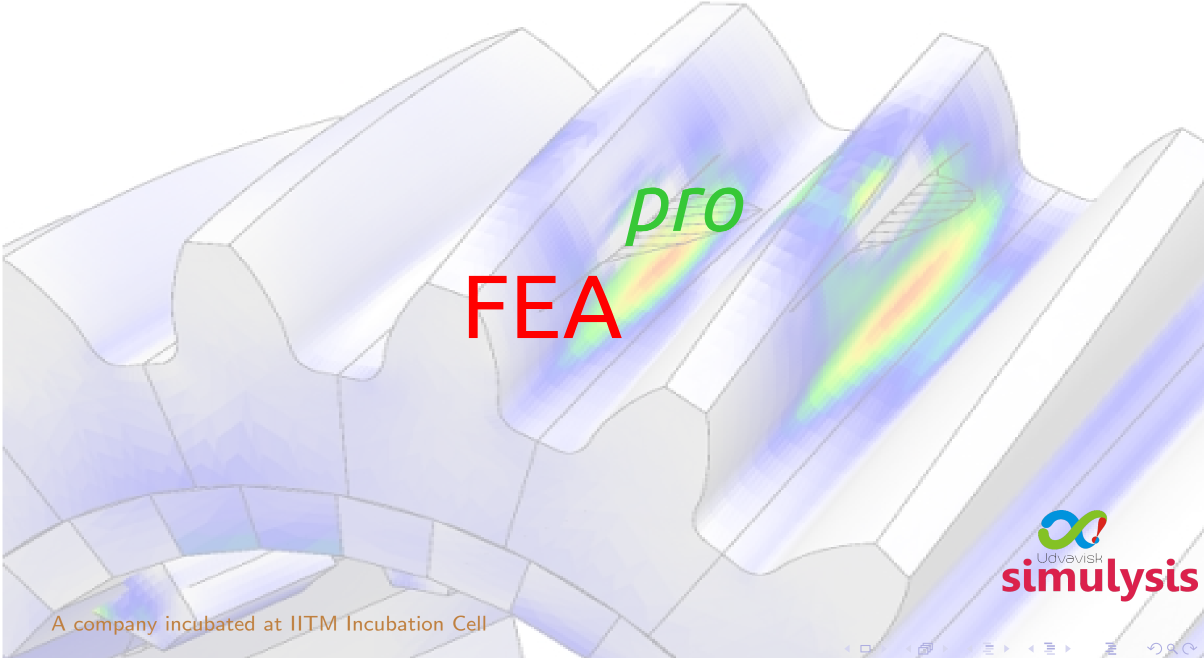

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Static Structural Analysis

A static analysis calculates the effects of steady loading conditions on a structure, while ignoring inertia and damping effects.

Learning Objectives:

- Understanding Governing Equation and FEA formulation
- Initial case set-up
- Material property assignment
- How to decide boundary conditions?
- Loading
- Result validation

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Vibration and Dynamic Analysis

This analysis is used to determine the dynamic response of a structure under a time-varying load. The time frame for this type of analysis is such that, inertia or damping effects of the structure are considered to be important.

Learning Objectives:

- Finite element modelling of dynamic problems
- Modal analysis
- Harmonic analysis
- Dynamic stress analysis

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Thermal and Thermo-structural Analysis

Thermal analysis is the application of the finite element method to calculate the temperature distribution within a solid structure. Thermo-structural analysis is used to determine the stresses due to thermal load and physical constraints.

Learning Objectives:

- Governing equation for heat transfer
- Steady and transient problems
- Applying temperature, heat flux and convection boundary conditions.
- Coupling of thermal and structural analysis

Contact Analysis

The goal of contact analysis is to determine the contact stresses transmitted across the interfaces. These stresses depend on the area of contact which, once again depend on the contact force. Hence this problem is non-linear. Contact is a changing-status non-linearity. That is, the stiffness of the system depends on the contact status, whether parts are touching or separated.

Learning Objectives:

- Analysis of assemblies
- Glue contact
- Physical contact
- Contact with friction

Material Non-linearity Analysis

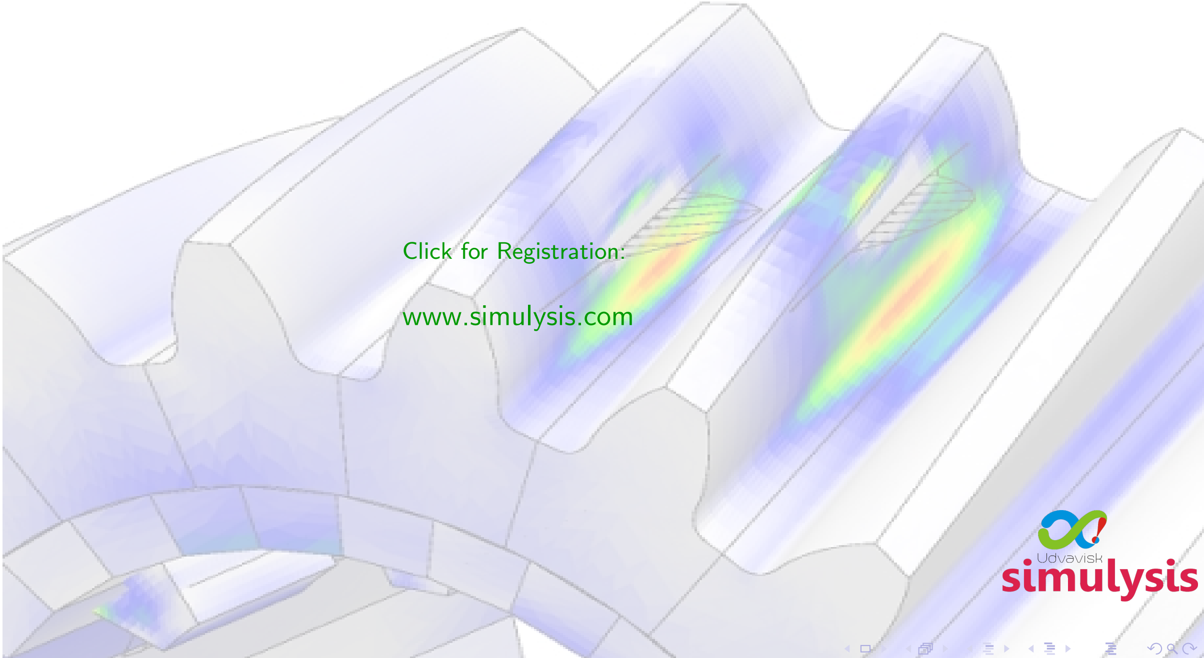
Material non-linearity arises when the structure is assigned with non-linear material like rubber or material is subjected to stresses beyond elastic limit.

Learning Objectives:

- Understanding material models
- Elasto-plastic analysis
- Hyper-elastic analysis for rubber like material
- Material models like Mooney-rivilin, Ogden, Arruda-Boyce

Efficient Solution Strategy

- Geometry simplification
- Mesh quality evaluation and control
- Selection of element types (3D, Shell, Tetra, Hexa, Quad, Tria etc.)
- Convergence
- Grid independence study
- Validation



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