

ODYSSEE

Artificial Intelligence / Machine Learning
for Enhanced Engineering








Solving your engineering problems in real-time






*Want to reduce two months of work down to just one week?
This is the power of AI/ML applied to CAE simulation and production.*

Hexagon's AI/ML solution, specifically designed for engineers, employs predictive techniques that can work effectively with small datasets (which make up about 10% of the data typically needed for traditional ML). As a result, engineers can avoid the challenges of generating large amounts of data, which is time-consuming and expensive. But we won't stop there - ODYSSEE is improving continuously as more techniques are incorporated into the learning models over time.

Challenges tackled with AI/ML:

-  **Inefficient processes** – Manual processes that are time-consuming and error-prone that lead to lower efficiency and productivity.
-  **Higher costs** – Expensive manual processes that result in higher operational costs.
-  **Limited scalability** – Difficulty scaling operations, handling large datasets and complex processes.
-  **Inaccurate decision-making** – Limited data available to make informed decisions, leading to inaccurate or suboptimal outcomes.
-  **Lower quality** – Lower quality products or services that lack capabilities to optimise processes and identify areas for improvement.

Overcome your challenges with ODYSSEE solutions:

-  Reduce costs by optimising processes, predicting maintenance needs, and minimising waste
-  Better decision-making and faster predictive analysis & optimisation through AI/ML algorithms
-  Identify patterns and trends in data that allow faster predictions and forecasts
-  Adaptive learning with continuous improvement
-  Scalability to handle large and complex data sets and processes

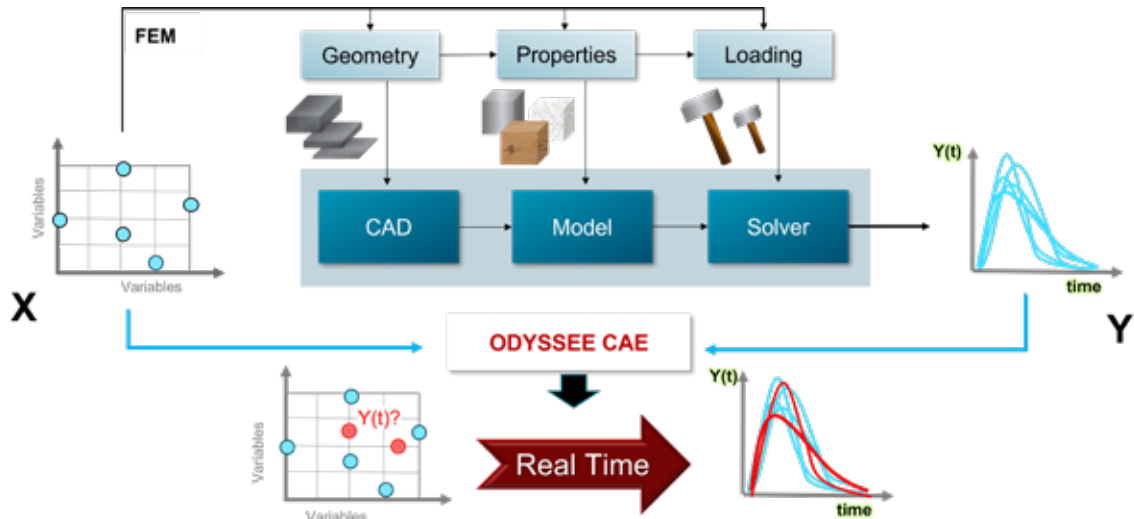
Hexagon's premier AI/ML ODYSSEE solutions



ODYSSEE CAE

Perform CAE design space exploration to broaden your horizons

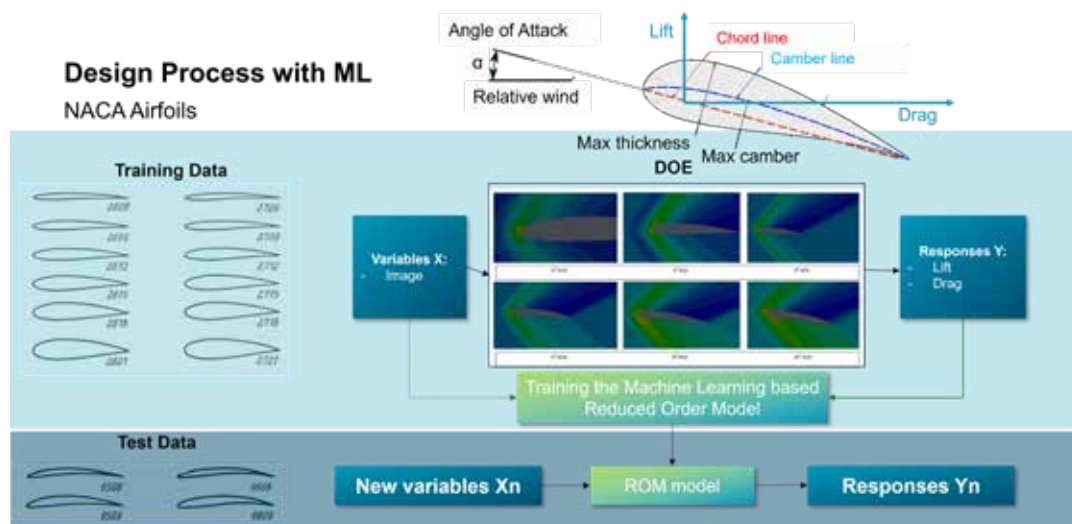
ODYSSEE CAE is an innovative platform for engineers that integrates machine learning, artificial intelligence, reduced order modelling, and design optimisation into workflows. It enables cost-efficient digital twin creation through real-time predictive modelling and optimisation by leveraging CAE simulation and physical test data. With minimal prior simulations, ODYSSEE CAE can quickly generate accurate results and full-time history outputs.



ODYSSEE A-Eye

Image based learning and prediction

ODYSSEE A-Eye is a machine learning solution for accelerating product design and development through image and CAD-based learning. Using images, CAD and sensor data as inputs, ODYSSEE A-Eye creates customised AI applications that predict output responses and field data. This enables designers and production technicians to explore the design space thoroughly and design next-generation products efficiently without excessive computing time and cost.



Backbones of ODYSSEE Solutions



ODYSSEE Solver

The powerful AI engine

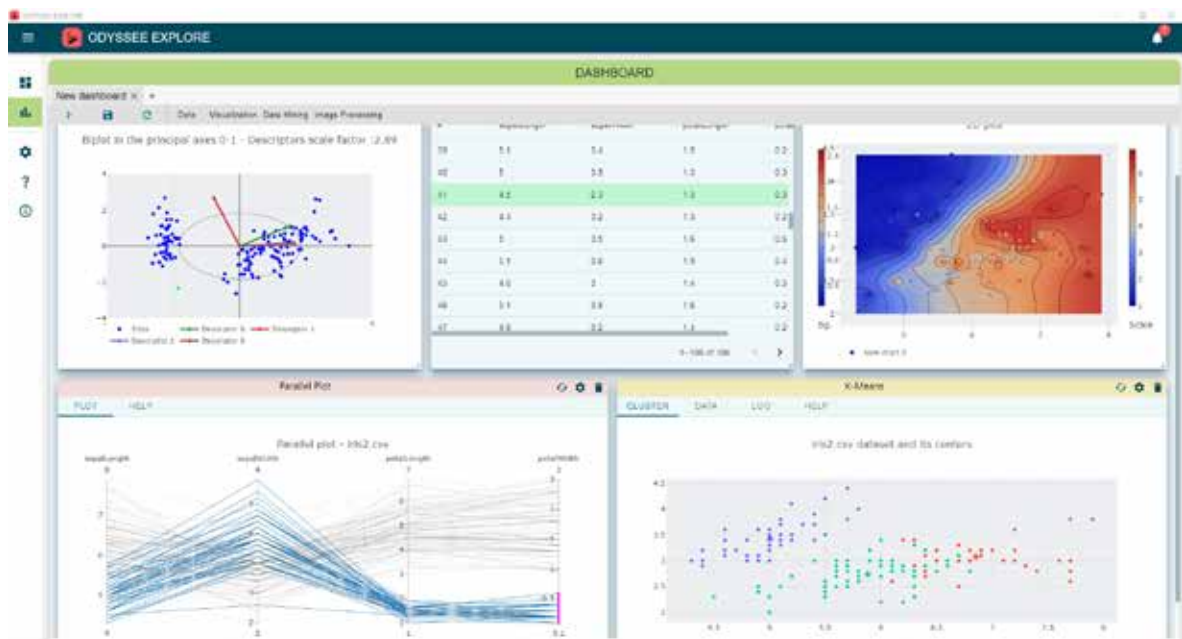
ODYSSEE Solver includes the Artificial Intelligence engine Quasar and the optimiser Nova. Quasar is an object-oriented programming language that allows configurable computations for data mining, prediction, interpolation, classification, image processing, matrix operations etc. Quasar is the AI engine powering ODYSSEE products, and it is integrated into multiple products within the Hexagon portfolio, such as Cradle, MSC Nastran (through smart sub-modelling), Marc, Adams (through FMU), and more.



ODYSSEE Explore

Data analysis and data mining managed by interactive dashboards

ODYSSEE Explore is an application for exploratory data analysis and data visualisation. It helps in performing data preprocessing and feature engineering before using the data for machine learning, and it helps in visualising output responses and outliers.



Contact us and join our community:

Learn more on hexagon.com/products/odyssee

"ODYSSEE software is a real breakthrough and provides very promising perspectives in order to reduce drastically computing time and optimize our designs."

Bengt Pipkorn

Director Simulation and Active Structures, Autoliv Research

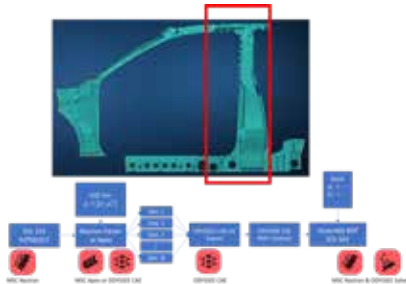


Hexagon's Ecosystem

Use ODYSSEE in combination with Hexagon's broad software portfolio, to unlock further potential and optimise your manufacturing.



Some integration examples



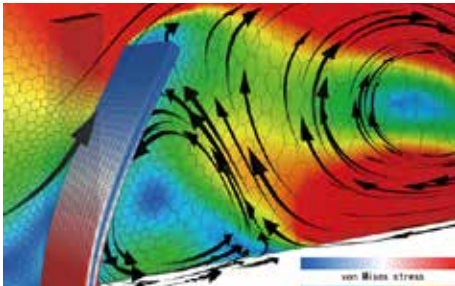
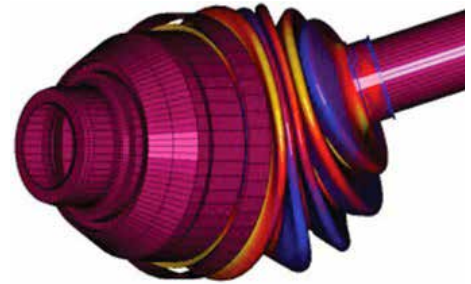
MSC Nastran

The MSC Nastran parser is available in ODYSSEE CAE to perform data preprocessing on MSC Nastran results to run real time parametric study, reverse engineering, optimisation, and robustness simulations. ODYSSEE CAE can also export smart parametric super element for MSC Nastran.



Marc

ODYSSEE is integrated into Marc/Mentat to generate input data based on Marc calculations (DOE, model preparation, computation and results extraction). ODYSSEE CAE can also export smart parametric super element for Marc.



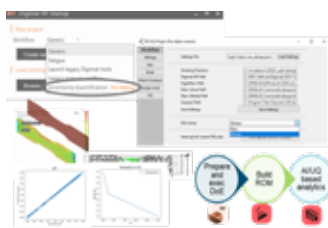
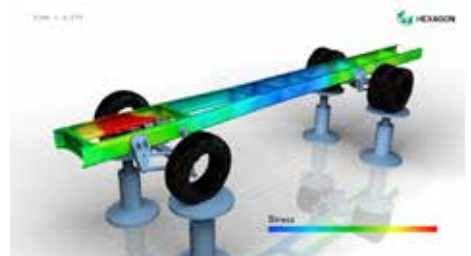
Cradle CFD

The ODYSSEE solver is integrated into scFLOW to generate surrogate models automatically, extract the results and predict any new simulation in a few seconds, including time history curves and animations. ODYSSEE can also export FMU CFD models for efficient co-simulation (for example with Adams).



Adams

The Adams parser is available in ODYSSEE CAE to simulate different multi-body dynamics and real-time scenarios more efficiently. ODYSSEE models can also be exported as FMU for easy coupling with Adams models.



Digimat-RP

Reliable design for reinforced plastics delivered in a plugin for Digimat-RP 2023.2, to perform Uncertainty Quantification (UQ) based analysis using ODYSSEE Quasar as the AI brain.

Find out more on hexagon.com/products/



Hexagon is a global leader in digital reality solutions, combining sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector, and mobility applications.

Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Manufacturing Intelligence division provides solutions that use data from design and engineering, production and metrology to make manufacturing smarter. For more information, visit hexagon.com.

Learn more about Hexagon (Nasdaq Stockholm: HEXA B) at hexagon.com and follow us [@HexagonAB](https://twitter.com/HexagonAB).