Protecting critical defense and aerospace assets with the world's fastest, most detailed and most scalable digital twin – the Digital Guardian

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Other digital twins on the market currently use Finite Element Analysis (FEA) which is not capable of modelling large scale assets to a sufficient level of accuracy in a timely manner to enable predictive analytics.

Akselos’ Digital Guardian is not only capable of modelling large scale assets, but it is the only physics-based digital twin that is compatible with the Internet of Things and big data.

Our patented algorithm, Reduced Basis FEA, was 15 years in the making at leading research institutes, including the Swiss Federal Institute of Technology, and under exclusive license from MIT. It constitutes 150 years of Research & Development.

It’s 1000x faster than the industry standard.

Its parameterized full 3D models can be reconfigured and resolved in seconds – instead of months.

The parametrized full 3D models can be reconfigured in seconds, instead of months. The results are then incorporated into a Digital Guardian to monitor the current structural integrity of the asset, as well as predict the future. Localised nonlinear effects, multiple load case scenarios, and external class society code checks may be considered where required.

Akselos uses cloud-based solvers for fast analysis and enhanced collaboration between engineers, which makes it user-friendly for teams working in different or remote locations. Akselos licensing facilitates/encourages the assessment of multiple structural conditions simultaneously on the cloud. Allowing the exploration of “as could be” configurations of the structure in addition to the “as is”, such as taking into account combat damage and other problems.

Engineers can quickly test scenarios, this means that companies can move towards zero unplanned downtime and better informed decision making processes regarding structural integrity.
Extending the life of assets safely and efficiently is important. Akselos’ technology enables companies to boost operational efficiency, reduce downtime and extend the life of assets.

As Defense assets often contain added intricacy due to their national security function and as lifecycle durations are measured in decades, accurate and efficient integrity assessment can be a more complex task.

In a capital-intensive industry, maintaining the value of the asset through its lifecycle is important, and in a defense or aerospace situation it is critical – it could mean the difference between life and death.

In defense situations, downtime to fix a problem may not be an option. Remote access, big data and sensors are able to deliver solutions to problems before they happen – with the right infrastructure.

Akselos models can be scaled up to encompass assets of the largest size and complexity – including all defense and aerospace assets – the technology is also best placed to handle the increasing complexity of new design concepts.

In space, NASA’s telescopes are operating decades past their intended design life. NASA’s Hubble Space Telescope was in “safe mode” for two weeks in October 2018 and unable to collect data – with a Digital Twin, predictive analytics would enable engineers to avoid such situations.

“There are several digital twin technologies in the market. But if you ask me, I will tell you that Akselos is the best.”

Geert van de Wouw, Vice President Shell Ventures.
Our technology has the capability of having a powerful impact on defense and aerospace.

Entire visibility of the condition of an asset

Understand structural capacity to support Asset Life Extension

Data that helps businesses make smarter, informed decisions

What if? Virtual scenario planning

Optimised maintenance schedules enabling a move towards zero unplanned downtime

PART OF A NEW DIGITAL ERA FOR DEFENSE & AEROSPACE
What happens when you combine the world’s most powerful Digital Twin with sensors and big data analytics? You create a Digital Guardian that protects your asset and allows you to navigate the future’s obstacles with ease. Coupled with big data from sensors, Akselos’ Digital Guardian technology creates a virtual nervous system which allows you to monitor and interact with your entire asset in real time.

With a smart and connected asset, operators no longer have to rely on manual inspection to understand its condition: they have access to a predictive Digital Guardian that helps engineers fix structural defects before they happen.

The technology has the power to revolutionize how we build and manage our critical infrastructure, and push the boundaries of what modern engineering and data analytics can achieve.

Akselos worked with Shell to prove the Digital Guardian concept through a two year Joint Industry Project, finishing in spring 2019, to bring asset management into the future.
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