

Digital Twins to Save Our Steel Bridges

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1 Steel Bridges of Yesterday

Most steel bridges in the Netherlands were built after the 1960s and are aging. These aging steel bridges require more attention and effective maintenance to ensure the safety of passengers, preserve connectivity, and decrease maintenance costs. But traditional methods are often slow, difficult, and prone to human errors.



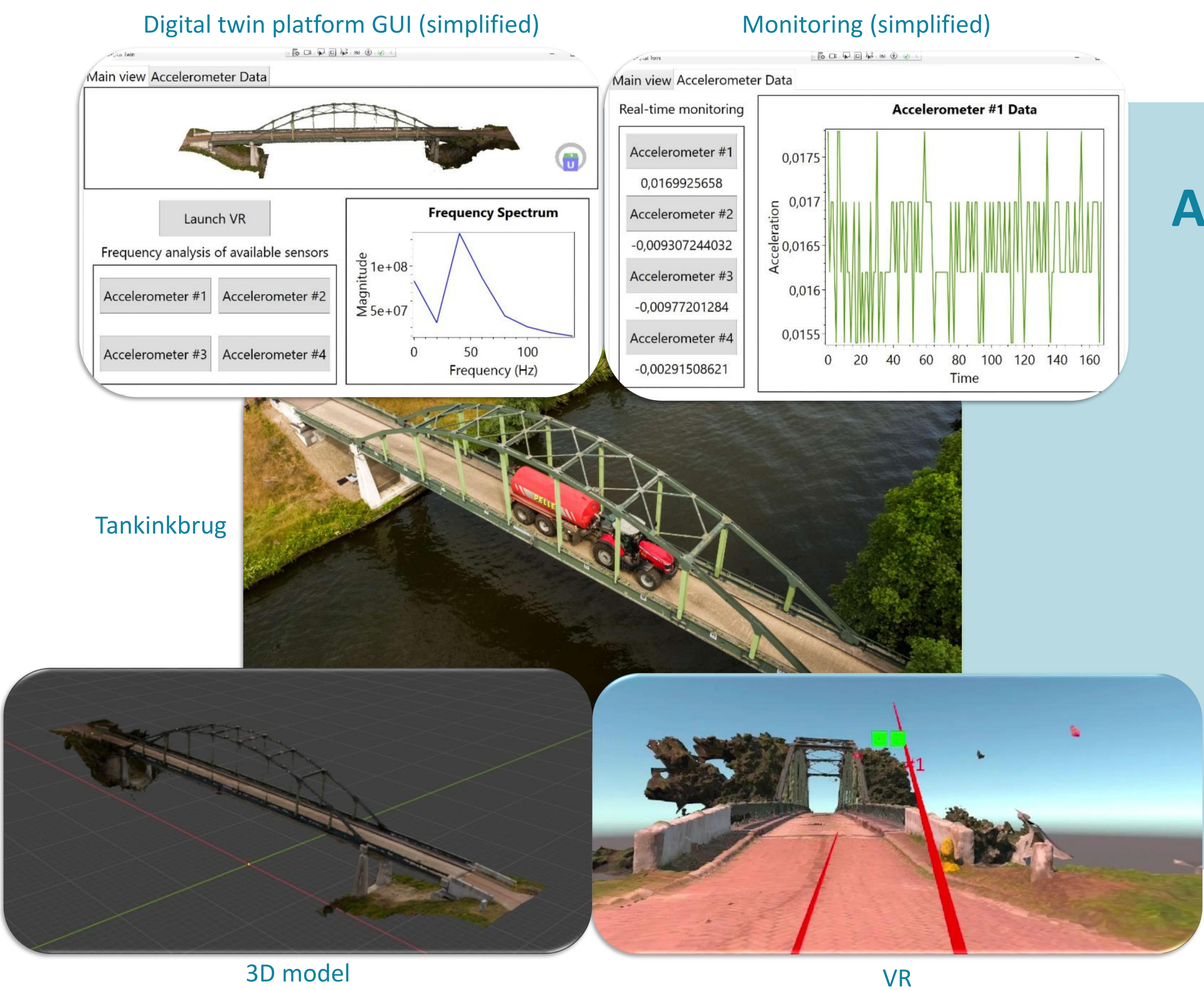
Source [https://bucharthorn.com]

- Digital twins of steel bridges are virtual replicas of the asset that:
- Are dynamic
 - Integrate cutting-edge technologies
 - Utilize the past, present, and future
 - Streamline record-keeping

Digital Twins 2

3 Goals of Digital Twins

Digital twins can improve the speed, accuracy, objectiveness, and ease of steel bridge assessment.



A Digital Twin of Tankinkbrug 4

Digital twin components for Tankinkbrug include:

- Sensor network
- Unmanned aerial vehicle (UAV)
- Digital twin platform
- Graphical user interface (GUI)
- Real-time monitoring
- Interactive 3D model
- Virtual reality (VR)

5 The Bridges of Yesterday Meet the Needs of Tomorrow

- Digital twins integrate cutting-edge technologies, such as artificial intelligence (AI) and extended reality (XR) into the assessment process.
- VR facilitates the remote inspection of the bridge and improves the speed and ease of assessment.
- AI analysis methods increase the accuracy and objectiveness of the assessment.
- Next, a prediction module can be added to the digital twin to transform it into a predictive digital twin leveraging the data from the future.