



VIRTUAL VEHICLE is a leading international R&D center for the automotive and rail industries. The center focuses on advanced virtualization of vehicle development. This linking of numerical simulations and hardware testing leads to a powerful HW-SW system design. About 300 people are now employed at our site in Graz - their expertise enables the efficient development of affordable, safe and environmentally friendly vehicles.

## Master Thesis

### “Modeling Diagnostic and Therapeutic Imaging Equipment in Medical Technology: An Asset Administration Shell Approach”

Ref.Nr. C\_53

Master Thesis

The goal of this thesis is to explore the methodologies required to model Diagnostic and Therapeutic Imaging Equipment (DTIE) as digital twins using Asset Administration Shell (AAS) frameworks. It aims to analyze existing AAS practices, identify valuable use cases in medical technology, and implement a practical example to demonstrate the benefits and challenges of this approach.

The Master thesis is divided into three main sections. The first section reviews the current state of AAS frameworks and best practices. The second section analyses potential use cases where the AAS approach can be especially helpful. This involves identifying and examining various applications in the medical field where digital twins and AAS can improve efficiency, data integration, and system interoperability. The third section focuses on a practical implementation based on a real-world use case. This involves modelling a specific diagnostic imaging device using the AAS framework, using real data and validated simulation models to create a digital twin.

### Your Tasks

- Conduct a comprehensive review of existing Asset Administration Shell (AAS) frameworks and best practices.
- Identify and analyze potential use cases in the medical technology field where AAS can be beneficial.
- Develop a digital twin for a specific diagnostic imaging device using the AAS framework.
- Utilize empirical data and validated simulation models to support the digital twin creation and implementation.
- Assess the implementation process, quantifying efforts and benefits, and documenting findings in a detailed case study

### What we expect from you

- Profound knowledge in Information Technology (IT), simulation, or production technology.
- Proficiency in system modeling, and familiarity with cyber-physical systems.
- Ability to conduct thorough literature reviews and analyse current methods.
- Experience, knowledge and interest in applying theoretical frameworks to real-world scenarios, particularly in developing digital twins.
- Strong ability to document and present findings clearly, both in written and oral forms.

### What we offer

- Collaboration and contribution in an engaged, dynamic team
- Interesting work in an international research center
- **Paid** Thesis
- Mentoring program for new employees'

- Diverse sports and health activities regularly
- Corporate Events

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If you consent that your submitted data is also stored in our talent pool for up to 1 year after the last contact with you, please let us know by E-mail. You may withdraw your consent at any time.

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