

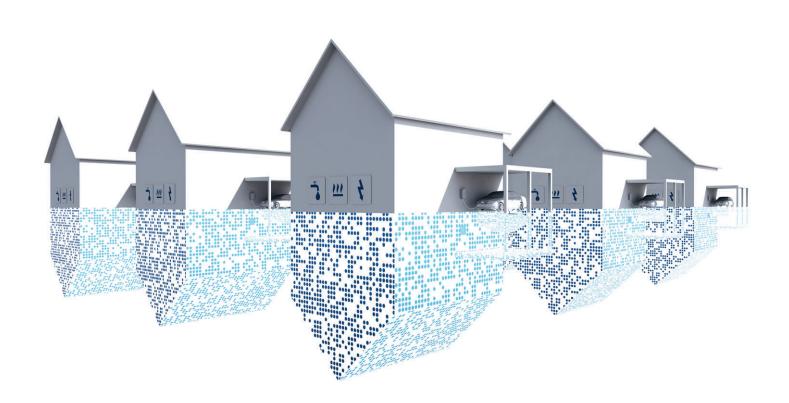
Digital Twin

Simulation is opening up new Options for public utilities

The environment in which public service corporations operate is changing as never before. The energy transition and digitalization are just two big trends. For public utilities, this means that, in future, they must provide their infrastructures with additional intelligence. This is no longer simply a matter of sensing and recording current states in ever greater detail. It is just as important in the meantime to be able to run through different scenarios with simulations.

In automotive development, Virtual Engineering and digital twins have played a key part for many years. They help engineers to cope with the growing level of complexity in the automotive world, develop new products faster while at the same time reducing costs. IAV wants to make these tried and proven approaches available to public service corporations so they will be able to successfully maintain their ground in the changing world of utilities.

In over 35 years of automotive engineering, IAV has gathered experience in complex systems, using this to enhance numerous digital tools and methods. We are now making this expertise available to customers from industry, e.g. for the Internet of Things (IoT). Among other aspects, our mathematicians, data scientists, IT specialists and control engineers are working on solutions that meet our customers' needs in an ideal manner. Whenever necessary, we cooperate with leading solution providers in customer projects.



Real-Time-Capable Models and Data Logistics



The digital twin provides assistance with ...



... planning, operating and maintaining ...



... important infrastructure.

Over recent years, energy transition and digitalization have prompted utilities, such as public service corporations, to equip their infrastructures for electricity, gas and water with modern sensor and actuator systems. Yet to remain competitive in future too, it is no longer sufficient simply to record the states of pumps or valves. Now it is a case of carrying out simulations using infrastructure models. This makes it possible, for instance, to explore where best to divert water in the event of a pipe burst or examine what happens to the power grid when more and more photovoltaic systems feed in low-voltage electric energy.

New options from modeling

For many years, IAV has been using models very successfully in automotive engineering. On HiL test benches, for example, they have the purpose of simulating a vehicle to a control unit. And digital twins of entire vehicles not only permit virtual crash tests but also the detailed planning of later production – long before real prototypes exist. Some of our real-time-capable models are based on the underlying physics as well as on maps. Some also use machine learning.

Tailor-made models for public utilities

IAV experts can generate mathematical models as digital twins of their customer's infrastructures which are matched in real time to the specific requirements of any public service corporation. This demands the use of professional data logistics: data must be read out from all sensors and made available centrally (such as in a computing center or a cloud). IAV offers its customers this service too. Doing so, we use our experience in evaluating test fleets from all over the world. This means public service corporations can build on the latest level of modeling and data logistics – an unbeatable combination.