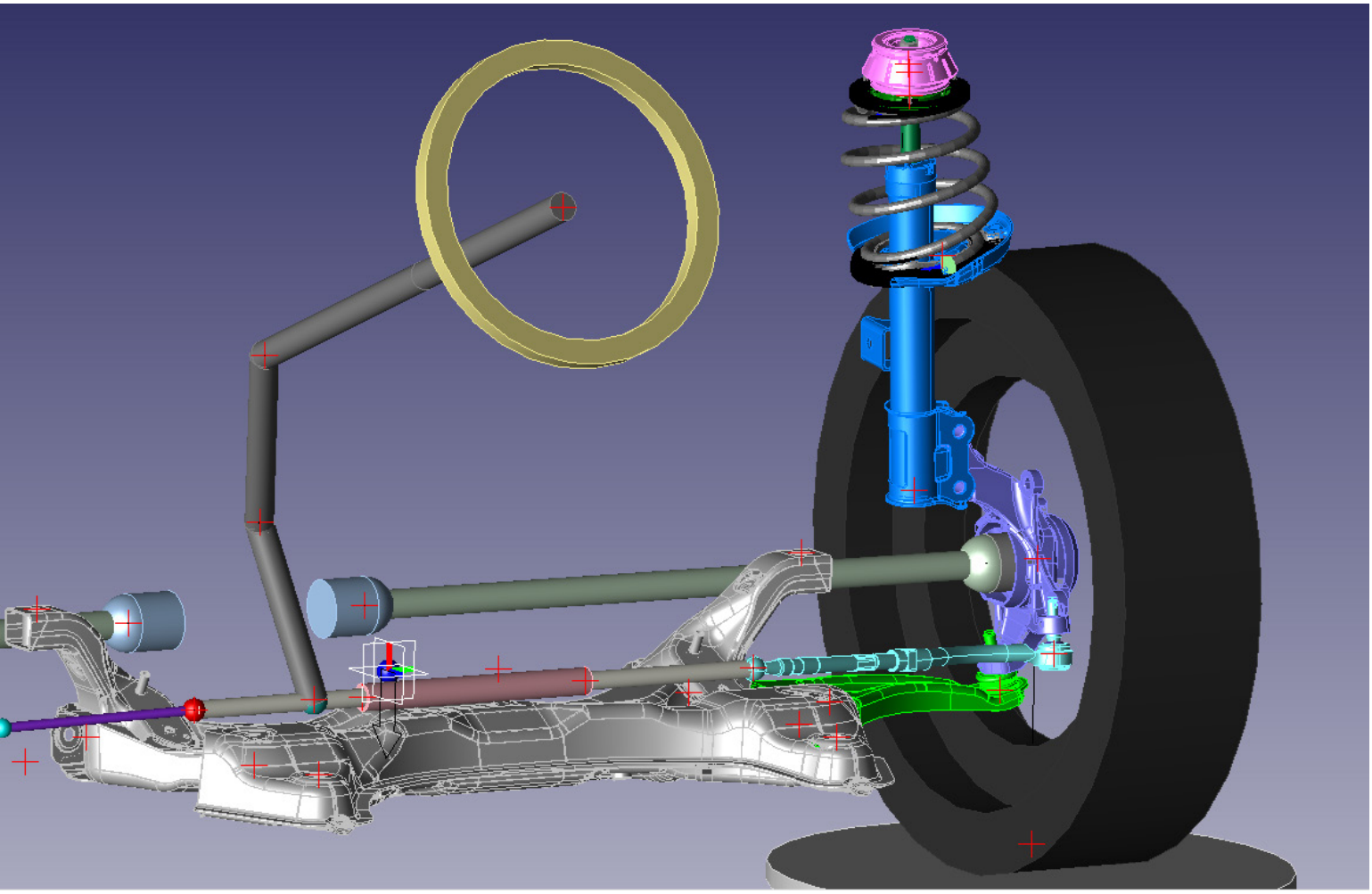
DASSAULT SYSTEMES

SPATIAL

Virtual Motion



Virtual Motion is a leading provider of CAE software for modeling and analysis of mechanical system dynamics for the automotive, electronics, and heavy industry markets.

Virtual Motion

Market:
Mechanical system dynamics and FEA analysis

Product:
3D ACIS Modeler, HOOPS 3D Application Frame-work, Applications Graphics Manager (AGM)

Challenges:
As a privately funded company, Virtual Motion had to deliver new product to market quickly to generate revenue. The company lacked time and resources to develop its own 3D geometry kernel.

Solutions:
Integrated Spatial 3D ACIS modeling engine and leveraged AGM and HOOPS to accelerate DAFUL software development

Results:
- **Reduced development time by 50% using AGM and ACIS**
- **Ensured seamless compatibility of DAFUL and ACIS models**
- **Gained competitive advantage through powerful 3D modeling APIs**

COMPANY

Founded in 2006, Virtual Motion develops and markets DAFUL (Korean word meaning "multi-physics"), a CAE software solution used for mechanical system dynamics and FEA analysis. DAFUL performs dynamic analysis of rigid and fl exible body systems each of which may undergo large translational and rotational displacements (multi-body dynamics).

DAFUL is currently sold in a range of Korean markets including automotive (e.g., Hyundai, its subsidiaries and parts suppliers), electronics (e.g., LG and Samsung) and heavy industry (e.g., Caterpillar). Virtual Motion has plans to expand to new geographic markets with localized versions and new software applications including computational fl uid dynamics, control and optimization.

Virtual Motion's customers use DAFUL to signifi cantly reduce the cost and time associated with designing mechanical systems. Parts and component designers use the software to perform analyses on virtual prototypes to ensure that the design meets functional and safety requirements. Without DAFUL, designers need to build multiple, costly prototypes before achieving the desired design.

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With DAFUL a designer creates or imports a 3D model to simulate a real-world environment, then analyzes various attachment points virtually, minimizing the amount of physical hardware prototypes needed. Virtual Motion's competitive strength is its computational speed, which is important to end-users because of the amount of processing required to perform one analysis. By enabling faster analysis DAFUL helps designers achieve an optimal design with less iteration and/or perform more design iterations in the same amount of time and achieve a higher quality product.

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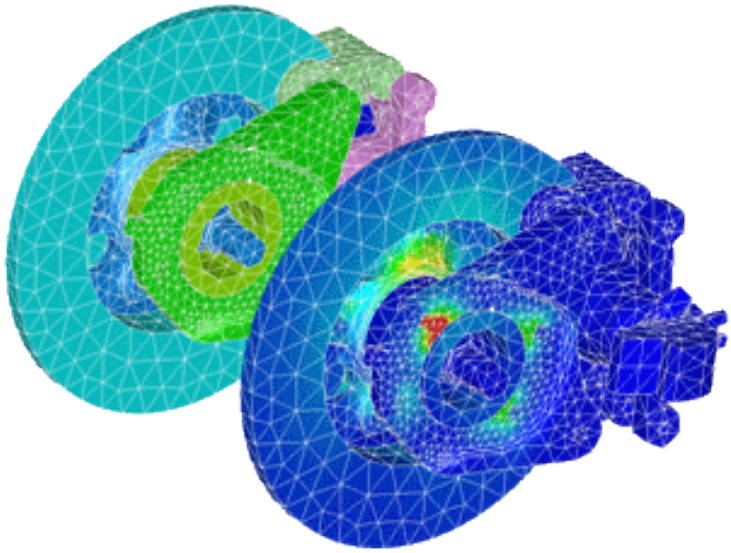
>
> *-- Prof. Daesung Bae Director of Research and Development Virtual Motion*



CHALLENGE

The greatest challenge for Virtual Motion was developing the software with limited human and fi nancial resources. In addition, the company needed to get the software on the market as quickly as possible to begin generating revenue. Because of the time-to-market constraints, the company decided to look to third party solutions for the software's 3D modeling kernel.

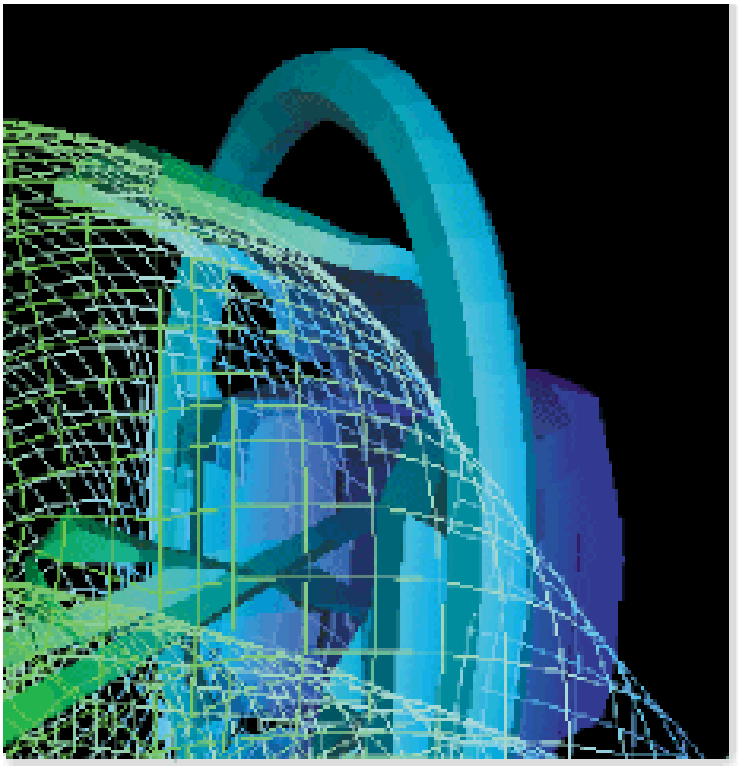
SOLUTION

Virtual Motion Director of Research and Development, Prof. Daesung Bae, who had experience with commercially available graphics kernels in a previous company, considered UGS Parasolid (now Siemens), but ultimately selected Spatial's ACIS technology, Applications Graphics Manager (AGM) and HOOPS Application Framework.

The decision to select Spatial's components was based on a number of important factors:

1. Ease of development and reliability of graphics performance and library – Virtual Motion developers found that the ACIS kernel has a very good object oriented class library making it very easy to program, especially when compared to other options.
2. Flexible pricing model – Spatial's pricing model matched Virtual Motion's software pricing and packaging model.
3. Compatibility with other object-oriented software and the ease of use of the translators, both of which minimize programming efforts.
4. Spatial's AGM library, which accelerates application development for both HOOPS and ACIS (Parasolid lacked this functionality).

In addition, as Prof. Bae weighed other options, he was very impressed with the responsiveness and professionalism of Spatial's regional manager. "When I outsource software to be part of my product, the company's reputation, reliability and support infrastructure are very important to me," says Prof. Bae.



From the start, Prof. Bae was impressed with Spatial's hands-on approach to getting Virtual Motion developers up and running. Spatial sent a technical expert to the company for a week of training during which Prof. Bae was able to have in-depth discussions about how Virtual Motion could optimize its software using ACIS, HOOPS and AGM.

an interface to send information to the geometry kernel for changing graphic properties. This eliminates the need for Virtual Motion developers to repeat the same development code in multiple places. Thus AGM greatly accelerated the development time, and consequently, time-to-market.

Virtual Motion also minimized its development eff ort by selecting Spatial's HOOPS 3D Application Framework with its built-in graphical simulation process. "Our system has a GUI to build components of mechanical systems and display them in 3D," says Prof. Bae. "HOOPS has a very good interface for connecting our components with Spatial components to manage graphical views such as the layout of menus."

While Virtual Motion customers sometimes build 3D geometry in DAFUL, about 80% import models from other CAD systems. Virtual Motion plans on using ACIS InterOp translators to facilitate the import of data to easily integrate advanced 3D data interoperability capabilities for STEP and Parasolid.

RESULTS

Using Spatial, Virtual Motion was able to cut its overall development time by 50%. "Spatial enabled us to minimize our programming eff orts so we were able to speed up our own development of the software and therefore generate revenue soon after launching the company," comments Prof. Bae. "In addition, the quality of graphics and performance is very good."

Prof. Bae is very satisfi ed with Spatial's technology and services and strongly recommends Spatial to other companies because of Spatial's reliability and ease with which Spatial components integrate with DAFUL components.

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