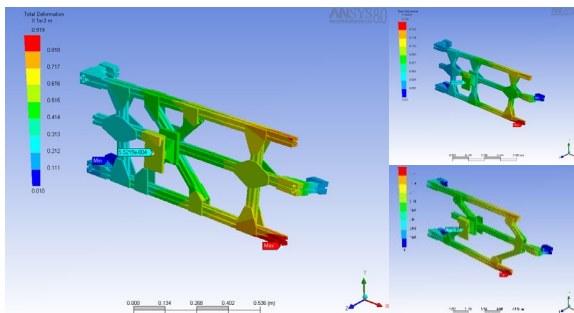


## FEA Optimization Improves Modular Test Frame

### Challenge:

A global manufacturer of non-contact gauging systems was developing algorithms for a new automotive application. They needed a means of mounting a 51 lb. car door to their test robot. This frame needed to be modular to allow adjustment, stiff to provide repeatable positioning, and delivered quickly to support an upcoming customer visit.



FEA studies of the final configuration and two early concepts

### The pi-V-ot Approach:

To meet cost and delivery requirements, we selected off-the-shelf components wherever possible. After identifying the key components, we designed several competing concepts using Solid Edge MCAD software, and then tested their strength using ANSYS Mechanical Pro. The interoperability of these systems allowed us to rapidly iterate until we arrived at a final configuration. The result was a frame that weighed only 42 lbs and had a maximum elastic (repeatable) deflection of .034" while carrying the door.

We then purchased the off-the-shelf components and our machine shop supplied the required custom items. We performed assembly and initial testing to validate the design. The frame was shipped assembled to our customer who had it installed and operational shortly after it arrived on their dock.

### Key services we provided:

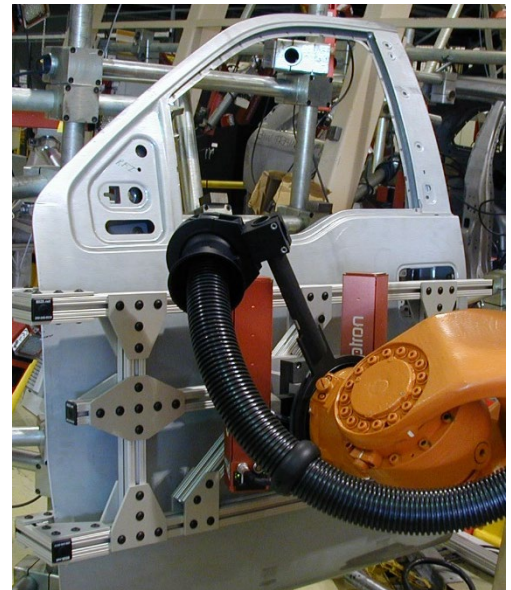
- Concept Modeling
- FEA Structural Simulation
- Prototyping
- Physical Load Testing

### Customer Benefits:

The frame was installed before the customer visit, and at last update, our client had used it to run more than 700,000 measurement cycles to evaluate the performance of their system. The frame has shown to be very repeatable and will be used in the future for validation testing when new algorithms are added to their sensing software.

### Bottom Line:

pi-V-ot quickly delivered a functional test frame which helped our client validate system performance for a new application.



Frame and door mounted to robot