CAE simulations play a major role in accurately predicting failure modes, determining durability of various automotive systems. Accurate initial and boundary conditions are required to make the simulation models replicate real life product operating modes and requirements.  
  
I built analytical models to predict the minimum closing velocity of automotive swing doors, accounting for various parameters like cabin air pressure, door and body seals, door latch and check link mechanism, hinge inclination and friction, as well as seal vents. Additionally, I also worked on resolving rattling issue from spare-wheel mounting mechanism on Fiat Avventura Cross-over vehicle by studying field data, road profiles, vehicle speeds, and bumper characteristics.

The results of my work are published in SAE International, and I was invited for presentation during the SAE World Congress-2016, Michigan.  
  
Link: <http://papers.sae.org/2016-01-0434/>

Additional Details: <https://seelio.com/w/3rjc/computer-aided-engineering-of-automotive-side-closures>