



## GENERAL MOTORS

### Spot Welding Process



#### Motivation

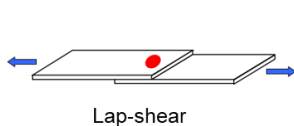
Welding simulations do not consider the manufacturing processes previously suffered by the material and use mathematical data that are not consistent with the actual properties of welded joints. This encourages the use of data-based approaches, as Artificial Intelligence (AI) techniques.

#### Objective

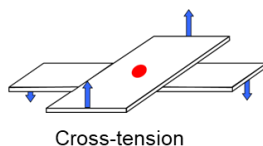
Predict the behavior of spot-welding quality joints, by the development of AI models with data responses from resistance welding process. The solution must be suitable to allow online process control in present scale of automotive industry.

#### Approach

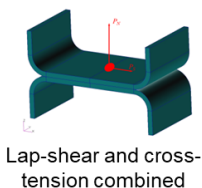
The quality of the spot-welding directly influences the structural integrity of automotive body shells. Currently welded joints are inspected by manually handled tools, which significantly compromises sampling volume in production. This project aims the experimental understanding of resistance welding, development and validation of machine learning models to inspect spot-welding in real time, obtaining reliable correlations with conventional methods.



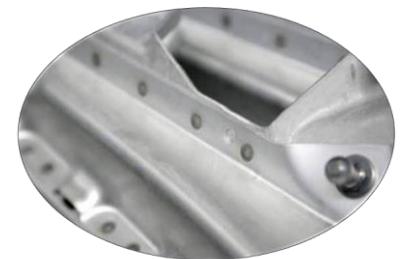
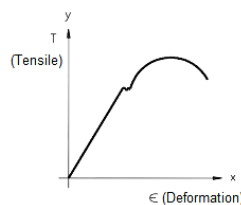
Lap-shear



Cross-tension



Lap-shear and cross-tension combined



Product Quality

Contact: +55 (12) 3947-6948

Praça Marechal-do-Ar Eduardo Gomes - Vila das Acácias  
São José dos Campos - SP, 12228-900

Project Responsible: Prof. Dr. Anderson Borille