

Customization of Femap FEA Preprocessor for Shipbuilders

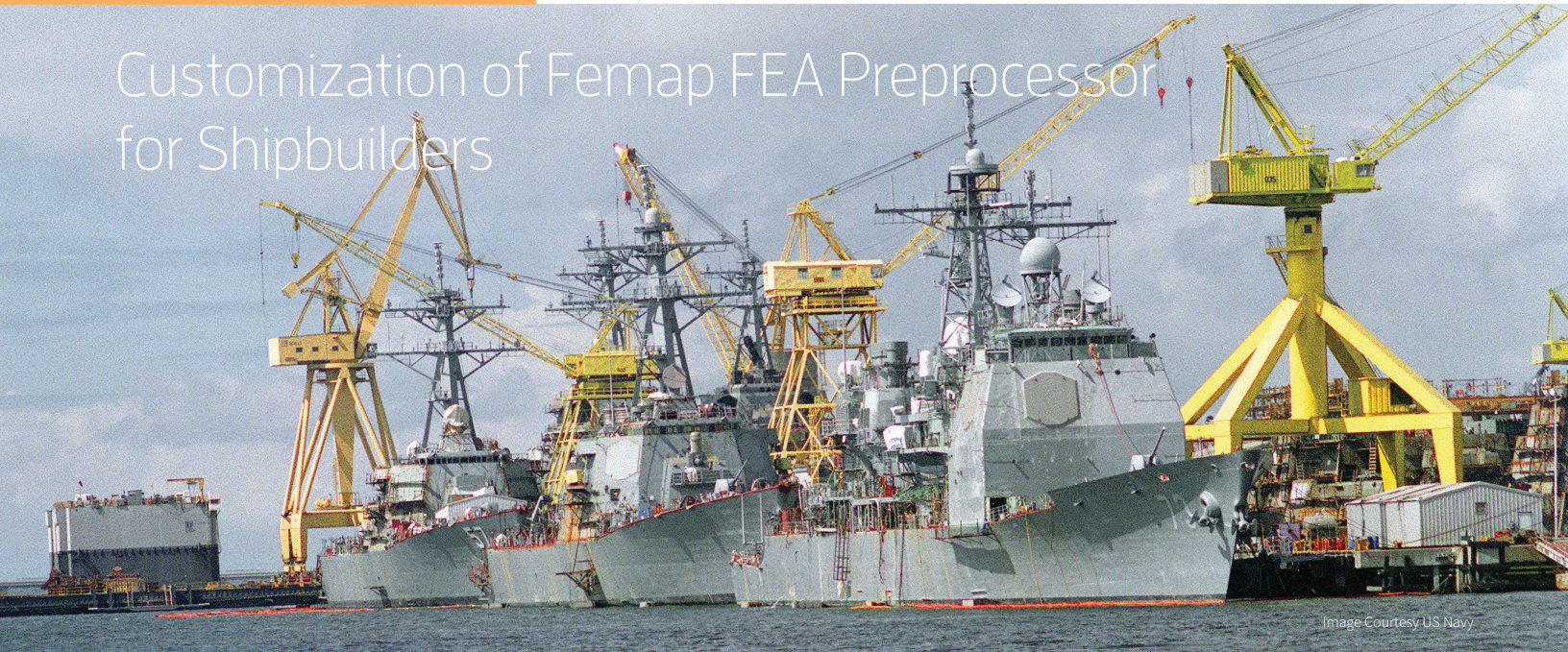


Image Courtesy: US Navy

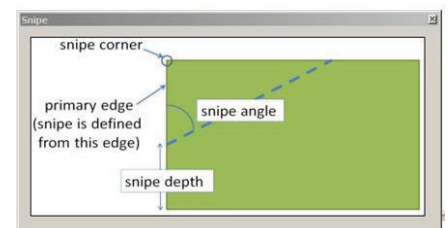
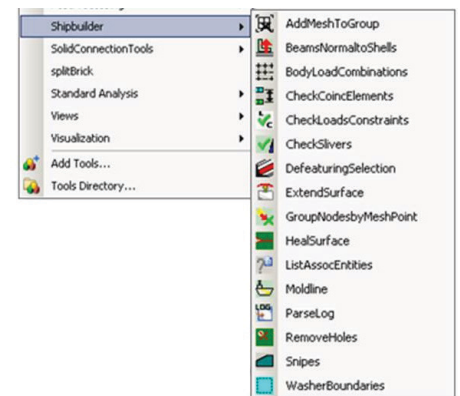
Case Study

OVERVIEW

ATA Engineering, Inc., (ATA) in support of Huntington Ingalls Industries (HII), was funded by the National Shipbuilding Research Program to automate the creation of finite element models in Femap. Based on requirements defined by HII, ATA created a Femap toolbox to reduce the amount of time necessary to create analysis models from CAD geometry. The tools aimed to automate manual tasks within Femap and provide shortcuts for tedious procedures. As the most time-consuming part of creating an analysis model is often the creation of meshable geometry, a process that can include simplification of geometry and creation of mid-surfaces, the toolbox contained several programs for creating or editing mid-surface models—allowing up to a 60% decrease in model creation time—as well as new methods for checking model quality and tools to aid with mesh grouping.

TASKS PERFORMED & KEY OUTCOMES

- Worked with HII to understand current analysis workflows and areas of frustration.
- Wrote Visual Basic programs to perform functions HII defined as most valuable in developing the models.
- Provided the toolbox to HII for software testing; ATA then updated the code to address requested enhancements.
- Provided the final toolkit to HII, along with a written user's manual describing the functionality of each tool in detail.



The final toolbox contained the sixteen tools listed in the menu; one of the tools cuts a snipe into a geometry surface