Fluent Simulation Software

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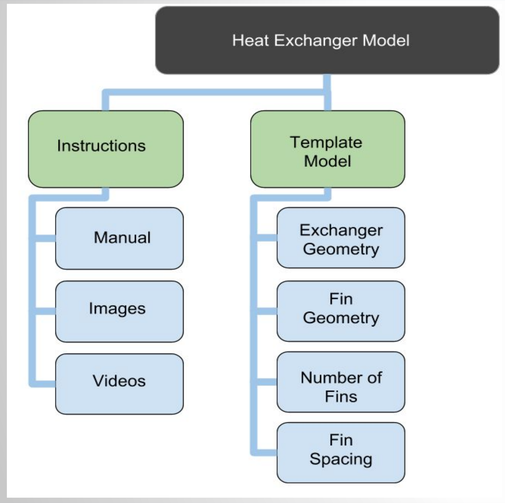
Abstract

Issue: CFD software, particularly ANSYS/Fluent is difficult to use and understand for people learning fluid mechanics and heat transfer. However, ability to use this software can provide fundamental knowledge to students in these disciplines.

Solution: To create tutorials and simulations that will allow students without fluent experience to use fluent to learn CFD and heat transfer fundamentals

Software Flow Chart



Project Roles

Jacob Thomas– Prototype Designer

Joseph Miller– Project Manager, technical writer

Evan Berg– Simulation verification

Ronald Luong- Model designer

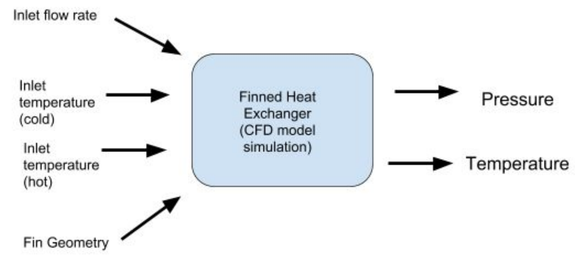
Tatiana Reeves- Chief Editor

Key Specifications

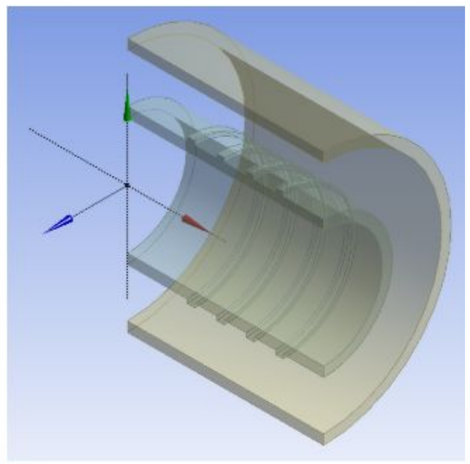
- Four fin heat exchanger ANSYS/Fluent model
  - Concentric fin Geometry
- Two-fluid system
  - hot fluid and coolant (separated)

System Diagram

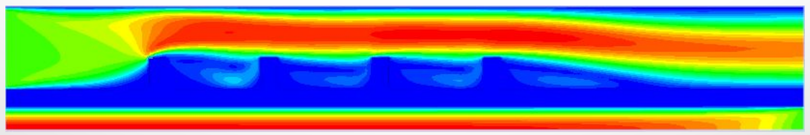
Our system takes different physical inputs and using fluent outputs different relevant outputs such as temperature and pressure. This bypasses mesh design and other complicated simulation design procedures.



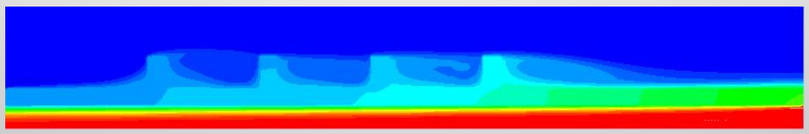
Preliminary Models



Four fin concentric heat exchanger



Velocity Contour Map



Temperature Contour Map

Solution Requirments

1. Package must be completed and ready for students to use
   - o Model must be complete for students' use
   - o Tutorial must walk students through model parameter input and running
2. Must converge to a solution in a timely manner
3. Must output data for velocity and temperature contours
4. Must provide multiple model files for data output comparisons
5. Must use ANSYS based software
6. Project files must be of reasonable size

Project Plan

- Concept
  - Identify an appropriate model for instruction
  - Model development
  - Final models developed and tutorial write-up creation
- Design
  - Prototype will be developed
  - Prototype Testing/Validation

Acknowledgements

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