An Interactive Web-based Tool for Fatigue Analysis and Life Prediction

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Abstract

• Interactive web-based tool creates a modern approach to fatigue analysis and life prediction for use in engineering classrooms.
• Bridge the gap between theory and reality.
• The unique attributes of this software allows engineering students to learn and gain more insight to fatigue analysis in a given semester.

Initial Customer Discovery (ICD)

• Conducted 30 customer interviews to determine the demand and need for software solution.
• Conducted market research at major universities with supporting engineering programs (Listed Below).

Market Research Conclusion: Engineering professors need an educational fatigue software to familiarize students with fatigue, better preparing them for product development roles in industry.

How it works?

• The web-based fatigue analysis tool provides just-in-time guidance that is simple and easy to use for engineering students.
• Combines existing fatigue principles in a new and novel approach and also utilizes a proprietary algorithm, which in turn provides a much quicker and comprehensive analysis.
• With the utilization of cloud computing, the web-based fatigue tool will be available anywhere and anytime with on demand updates.
• Engineering students will be able to learn basic fatigue concepts, solve homework problems, and conduct fatigue life analysis research all outside of the classroom, in an interactive and user friendly environment.

Step by Step input to the Software

Step 1: Choose the material

Step 2: a: Select Specimen Type

Step 2: b: Select Loading Conditions

Step 3: Life Prediction utilizing 4 different approaches.
1. Goodman
2. Morrow
3. SWT
4. Walker

*See output graphs for comparison

Output Graphs from Software

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Conclusions

• Market research conducted to verify need for educational fatigue software tool.
• Extensive software development performed, final features currently in development stage.
• Pilot test of software in classrooms soon to follow at WMU College of Engineering.