Altair | Partner Alliance

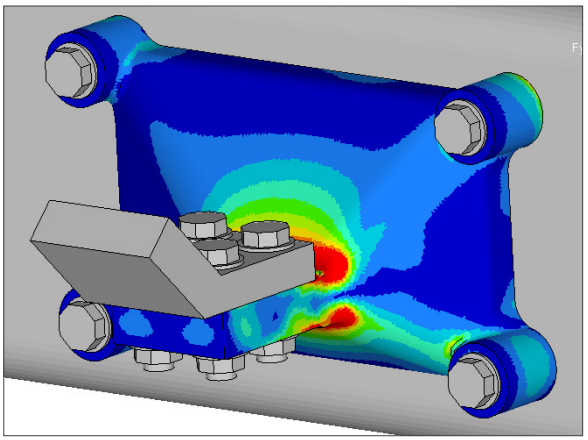
LW ENGINEERING SOFTWARE

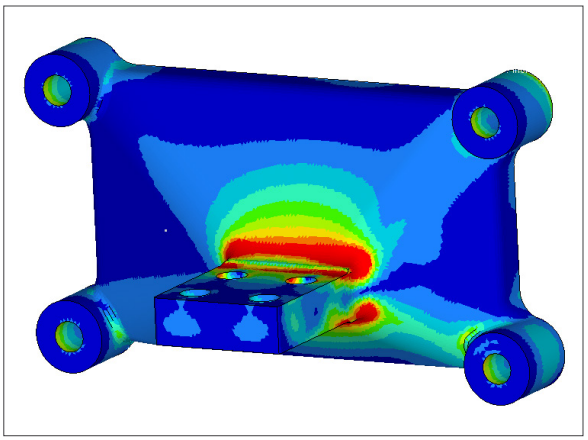
Partner Spotlight: Fieldscale

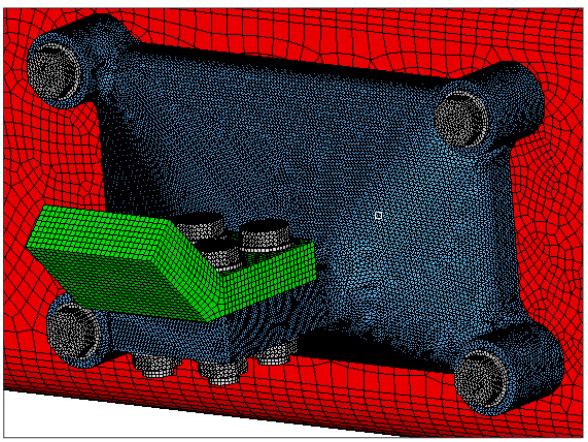
Shea Wilson, Co-Founder of LW Engineering Software AB, discusses strain gauge placement software, LW Finder, available through the Altair Partner Alliance.

APA: What prompted the development of your software? What problem(s) is LW Finder meant to solve?

Shea: My cofounder Mikael Littmann and I had spent our careers working as mechanical engineers in various industries in Sweden and the US. In industries as diverse as industrial robotics, vehicles, and farm machinery we encountered issues with noisy data and misleading results when using strain gauges to measure structural loads. We looked at the solutions on the market and couldn't find anything that we were happy with. We consequently developed our own software to determine optimal strain gauge placement and predict measurement errors. This software dramatically improved the quality of the measured data, and we realized it would be a valuable tool for other engineers.







APA: What are the benefits of using LW Finder for durability and strain gauge placement?

Shea: LW Finder takes the guesswork out of strain gauge placement. When using strain gauges to measure structural loads, it is often difficult to know where to place the gauges in order to minimize the measurement error. This is especially difficult when the structure is complex and subjected to several different load cases. The software finds the best locations to place strain gauges and predicts the measurement error. This results in higher quality load data and fewer repeated tests. LW Finder is able to compensate for non-linear behavior in the structure and can be configured to take into account the properties of an individual strain measurement setup. Additionally, the software allows the user to prioritize the load cases which should have minimum error, and selects gauge locations accordingly. Finally, the error prediction allows the engineer to know ahead of time if the test will give data of sufficient quality. This means better risk management and fewer disruptions to the project schedule due to unexpectedly bad test results.

APA: Are there any unique applications that LW Finder works for that your competition cannot?

Shea: A key difference is that LW Finder provides a prediction of measurement error. This is important for all measurement applications because this is the number that will tell the engineer if the test will give results of sufficient accuracy. Additionally, a user can prioritize load cases. This helps in applications when some load cases are more critical than others. Finally, the ability to deal with non-linear situations means that many types of difficult structures are now able to be measured accurately, for example structures which experience plastic deformation or with bolted joints.

APA: How much time does it take to learn and start using LW Finder?

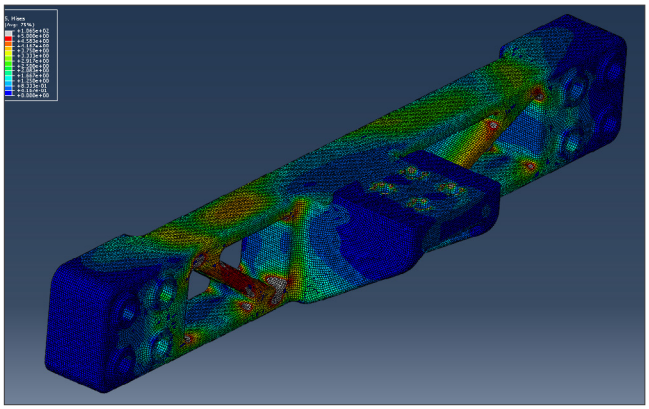
Shea: It takes about 20 minutes to read the manual and about 10 minutes to solve a simple demo problem. Depending on what pre/post-processor and solver are used, it can take anywhere from a couple minutes to a few hours to integrate LW Finder into your workflow.

APA: What's next for LW Engineering… what can we look forward to?

Shea: We are excited to start adding new tutorials and more seamless integration between different pre/post-processors and solvers. Keep a look out for tutorials in the next few weeks. We will be announcing the improved integration later this year.

A product demo is scheduled for May 12, 2016.

APA: What are the biggest challenges or problems that customers in your target market face and how do you address their needs?



Shea: As a result of increasing global competition, two interrelated challenges that our customers face are: decreasing project leadtimes and increasing product quality. For example, a vehicle design needs to be more weight optimized than ever before. In this example, accurate load data is needed to correctly dimension the load carrying parts, and when this data is coming from physical measurements of the vehicle on a test track, the quality of the measurement data has a direct impact on the quality of the design. Additionally, any surprises, such as very noisy data, can force the engineers to rerun the test, which can be very disruptive to the project schedule. LW Finder addresses these two issues by increasing the quality of the load data and by predicting the error ahead of time, resulting in fewer surprises and more optimized designs.

Another challenge that we were surprised to hear about is that as companies try to replace more and more of their physical testing with simulation, the need for accurate physical load measurements actually increases. This is for two reasons: it is necessary to validate new simulation models before they can be relied upon solely in the development process and in complex structures it is often only possible to get load cases by doing a physical measurement. LW Finder is specifically developed for these situations by enabling more accurate physical load measurements.

APA: Describe a typical workflow using LW Finder.

Shea: When setting up a physical load measurement with strain gauges, it is difficult to know where to place the strain gauges. The engineer first does a simulation of the part in their preferred solver (e.g. OptiStruct) with unit load cases. The solution to this simulation is read by LW Finder. The user enters information about the test, for example an estimate of the loads that will be measured and any sources of error. The software checks the possible combinations of gauge locations and angles and finds the ones that minimize error. This information is then used in the workshop to place the gauges. If it is seen that the error will be unacceptably large, it is sometimes possible to modify the part to create higher strain, for example by drilling holes.

For more information about LW Finder through the APA, visit the solution page.