User Solution: Wheat Grain Crush Curve Analysis System

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Responsible for providing valuable research information to the grains, grains processing and grains food industries, an independent Australian centre of expertise in grains, grain processing, milling and baking performs research analysis of large amounts of statistical data arises. The centre's need was for a customised software solution that could manage large statistical files (up to 100Mb) produced by a scientific grain crusher. An existing solution using Microsoft® Excel® became inadequate for managing large files, and hence could not display all the available data. The raw data file contained information on specific parameters describing the grain sample (including weight, moisture content, average conductance, etc) as well as the load characteristics on the grain over time as it was crushed. The software had to be able to view all the data and perform analysis upon the data collected from the crusher. Due to the nature of the centre's ground-breaking research, no previous analysis of grain crush data had been carried out, so a solution was created that leveraged the data analysis strengths of Neo Vista System Integrators (NVSI). A turn-key solution that was modular and able to conform to the often changing nature of grain research and development was required, so NVSI designed the code and datatype handling to be object orientated and easily upgradeable, with a plug-in style architecture.
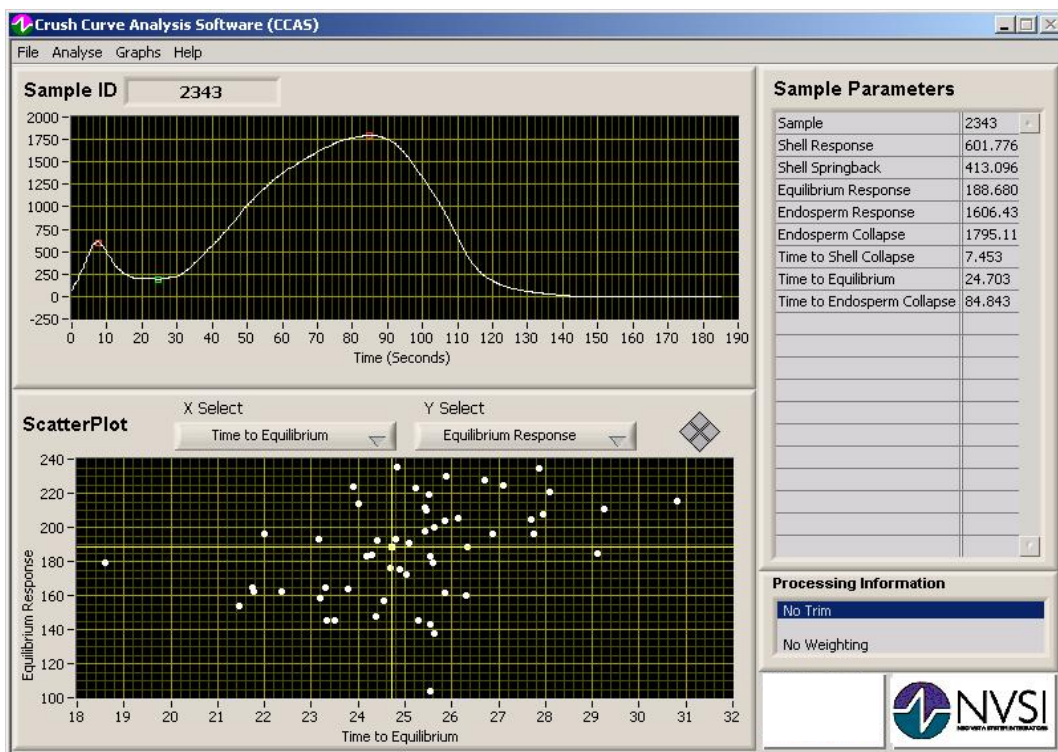
The Solution

NVSI created a software package that was able to handle large custom format statistical files, and perform peak-detection analysis on the averaged crush curves. After minimal analysis had occurred, other parameters could then be ascertained from the crush curve data. The relationships between the parameters were able to be viewed on a user intuitive XY scatter plot, and was developed using LabVIEW.

Further features of the software included trimming and weighting data set according to certain parameter values, exclusion of sample sets and historical data processing, ability to load additional external parameter sets for statistical comparison, save both the graphs and parameters in a separate user-defined format files, print crush curves and scatter plot relationships on a custom report, and handle alpha-numeric sample values.

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