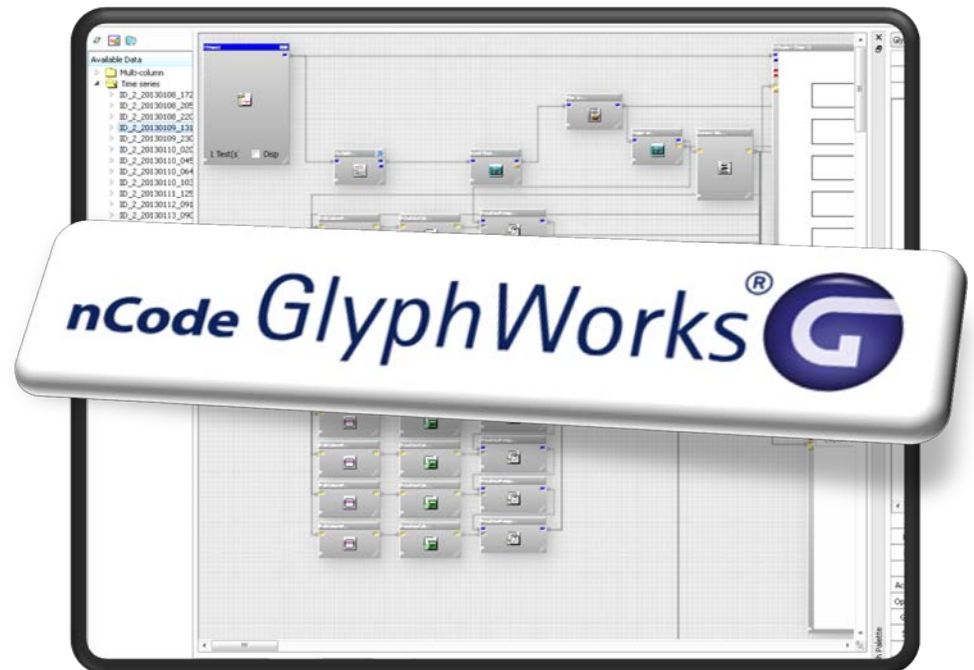
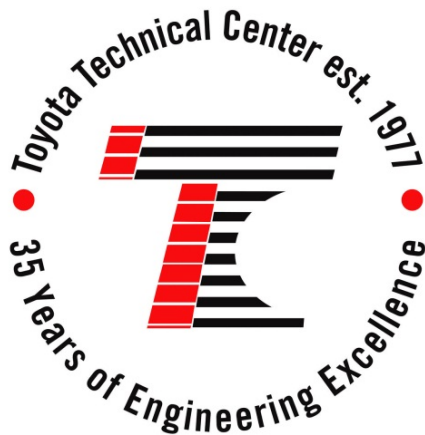
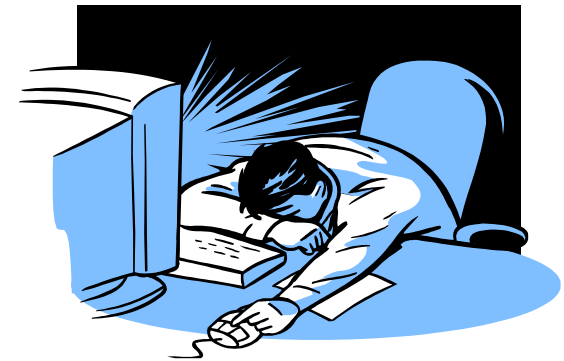
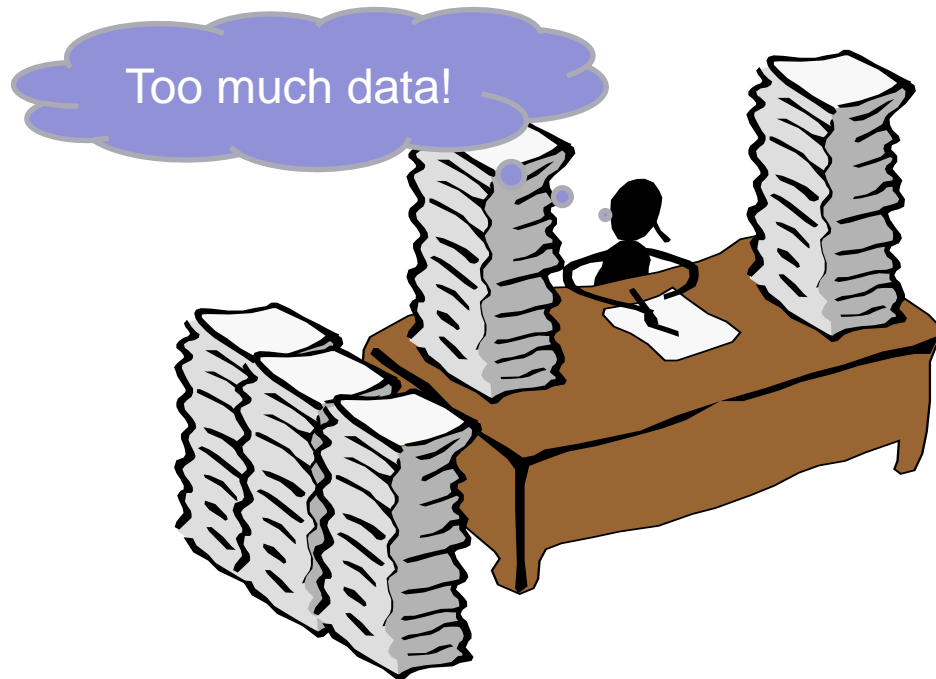


Using nCode Glyphworks to Process Large Data Files from Remote Vehicle Monitoring

Kyle Dart
Toyota Technical Center

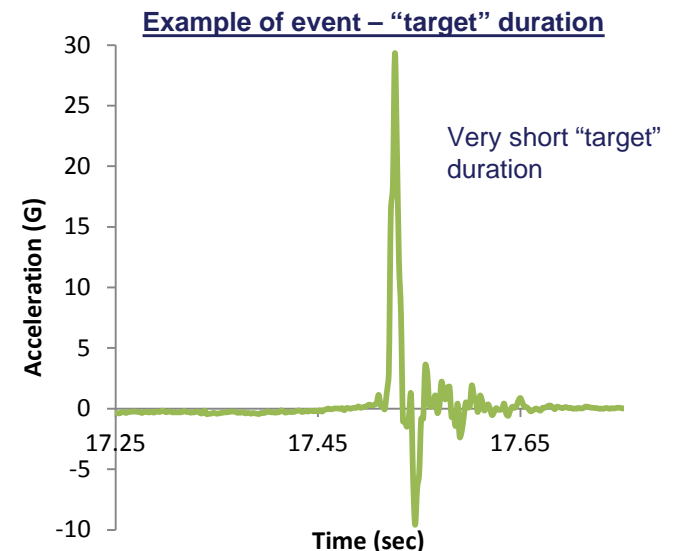
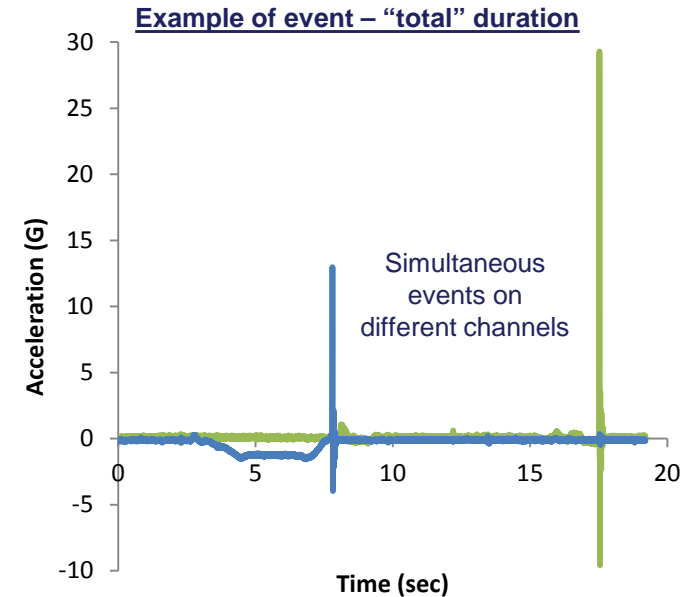


Project Background & Challenge

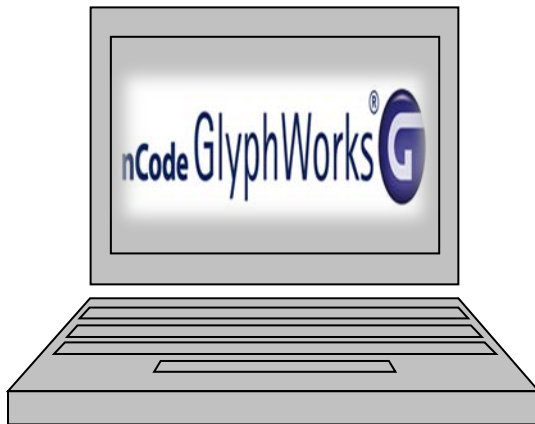


Project Background & Challenge

- Telemetry based vehicle monitoring
 - Monitoring door usage on vehicle
 - Data downloaded daily
- Very large data files
 - Long events with small target duration
 - High recording resolution required (500 Hz)
 - 1 to 1½ million data points per day
- Wide range of event characteristics
 - Event amplitude variation
 - Event duration variations
 - Simultaneous events (many channels)
- Multiple channels
- No way to automatically process data
 - Requires high man hours
 - Error in manual processing
 - Limits scope of project

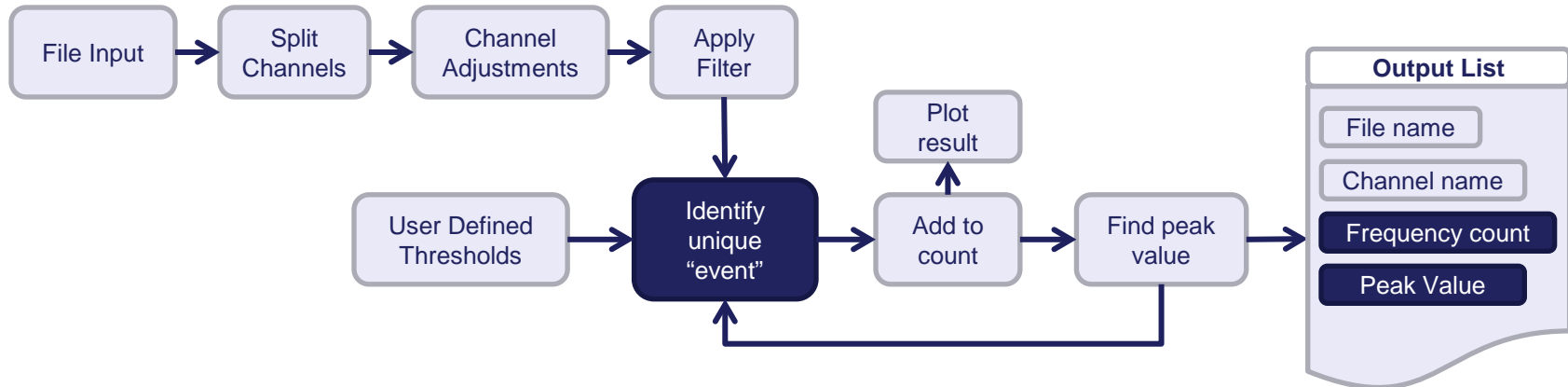


Project Solution: nCode Glyphworks to the rescue!



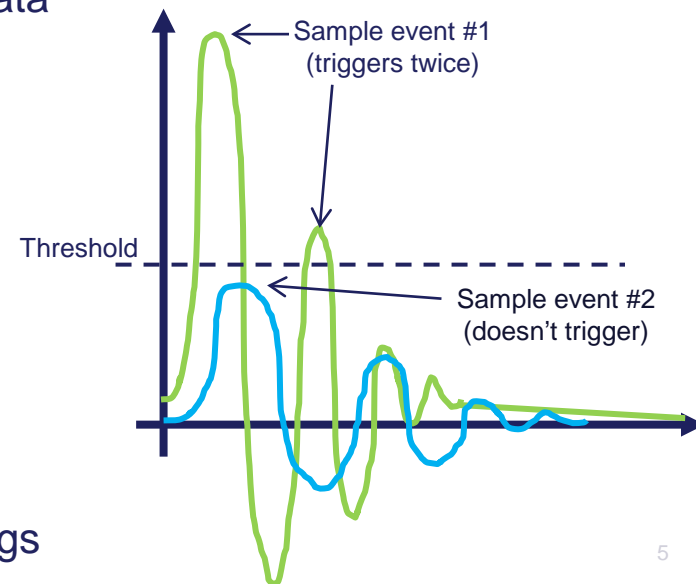
The Solution: Iteration #1

- Iteration #1 Flow



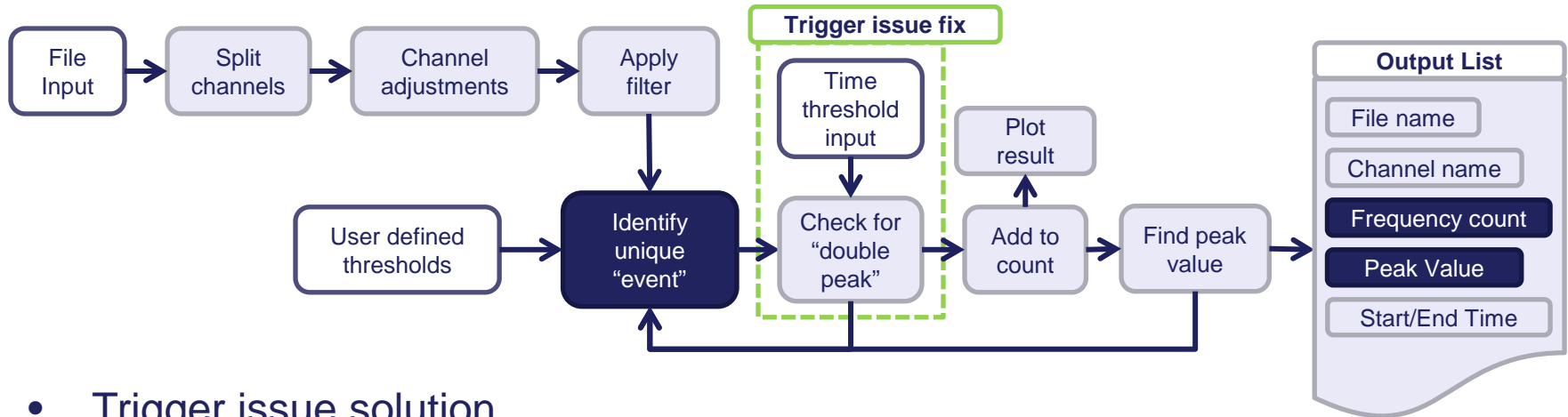
- Output data file
 - Results summarized w/ critical information
 - 1.5 million data points reduced to ~500 event data points (peak value & time of each)
- Processing time improvement
 - 2.5 hrs (manually) → 0.25 hrs (Glyphworks)
- Iteration #1 accuracy
 - Initial accuracy 90%, improved to 95%
 - Errors due to flow structure, not Glyphworks
- Identified issue
 - Variation in event magnitude too large for settings

Example of trigger issue



The Solution: Iteration #2

- Iteration #2 Flow



- Trigger issue solution

- Identify false-positive triggers by comparing event time information
- User defined time threshold

- Output data file

- Added start & end time to event data

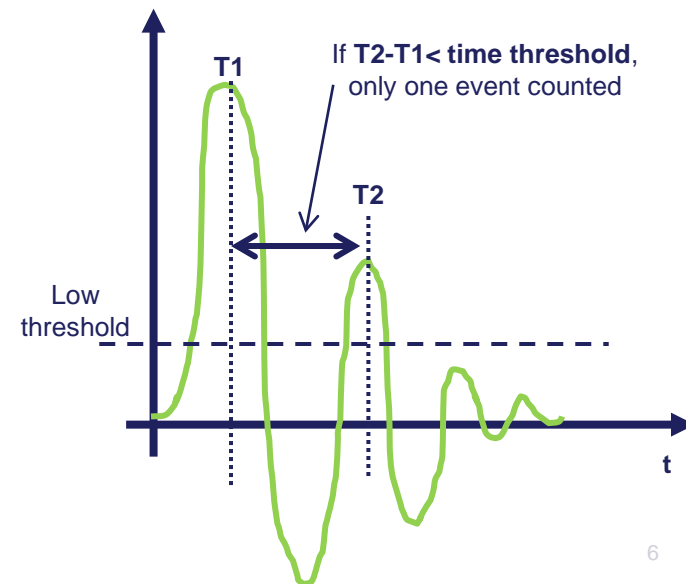
- Processing time (same as iteration #1)

- 2.5 hrs (manually) → 0.25 hrs (iteration #2)

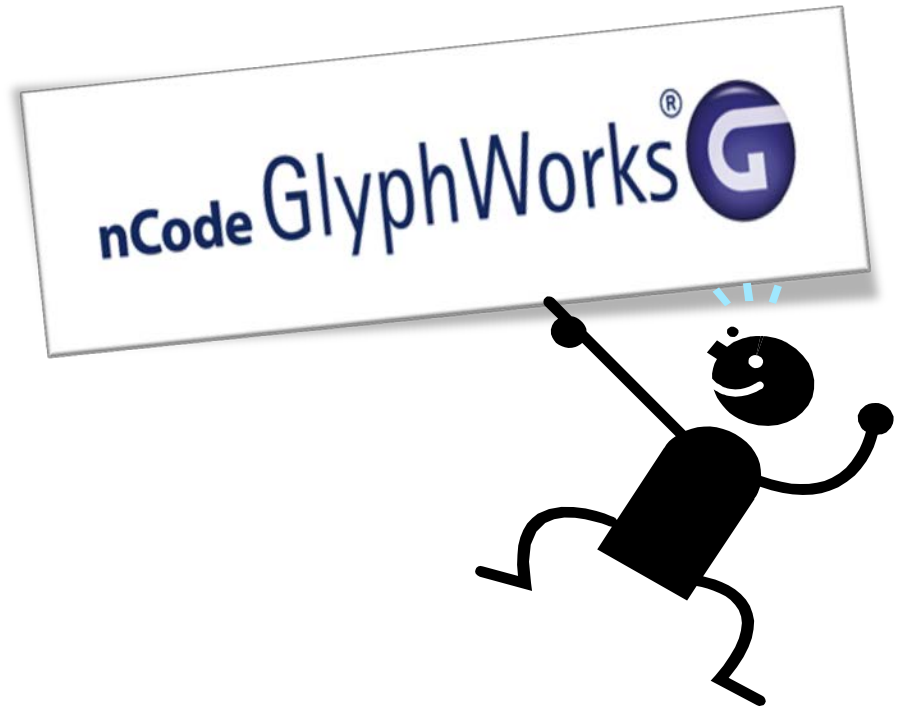
- Iteration #2 accuracy improvement

- 95% → 99.8% accurate
- Better then manual count long term

Trigger issue solution



Project Reflection



- Software capability
 - Both powerful and flexible
 - Modular style - quickly try different iterations
 - User friendly and great support
- Cost savings
 - Man hour reduction
 - 80% reduction in man hours for data processing
 - ~40 man hours saved for the project
 - Reduce additional software needed
 - Even simple use can be significant savings
- Accuracy improvement
 - Improved accuracy over manual processing
 - Allows larger sample sizes → more accurate test results
- Future use
 - Similar vehicle monitoring studies
 - Expanded breadth & depth of use

Thank you!

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