# Using Microsoft Excel for Traffic Crash Reconstruction

3-Day Class (Revised April. 2022)

Pre-Approved for 24 ACTAR CEUs

**Why use Excel for Traffic Crash Reconstruction?** Consider the following points:

- Errors have been found in commercial accident reconstruction software.
- You do not know what goes behind the scenes in commercial accident reconstruction software because you did not program it.
- Most jurors have at least heard of Excel because it comes free with many store-bought computers. Jurors are comfortable with Excel.
- You can testify that you programmed the equations yourself and that nothing unusual is happening behind the scenes.
- With Excel, you are not stuck with a pre-formatted results output. Your data may be customized for each reconstruction that you do.
- Excel can handle multiple phases of a crash reconstruction, while commercial software must deal with one phase at a time. For example, a spin analysis may be combined with any number of energy losses in one spreadsheet.
- There is not one accident reconstruction program that does everything. Excel can be programmed to do just about anything. You are only limited by your imagination.

**Topics Include:**

- EDR closing speed analysis.
- Calculating EDR cumulative delta-V from acceleration data (Toyota 13 EDR).
- Spin analysis.
- Conservation of Linear Momentum ("360° momentum").
- Airborne
- Critical speed yaw.
- Special attention is made to using Excel for ranging crash reconstructions (sensitivity analysis). This is accomplished using, charts, Monte Carlo analysis and the method of finite differences.
- The student will learn how to program their own user-defined functions (UDF). UDFs permit the student to hard code more difficult accident reconstruction formulas (think airborne, momentum) directly into Excel, so the formula may be used again later without programming the formula again.
- Making decision with the IF function.
- Please see our Web site for more details: www.Rich-LLC.com/Training.

**Class Modifications:**

- The class was modified in 2020. The prevalence of EDRs has made the use of crush not as popular as it once was. In the place of crush, the class concentrates more on EDR.
- Due to student demand, more time is spent with Monte Carlo analysis and advanced Monte Carlo techniques. Each class contains ~8 hours of Monte Carlo analysis.

**Prerequisites**: The student must have successfully completed an accident reconstruction/technical class.

**Required for class by each student**: A laptop computer running Microsoft Excel 2010 or later.

**Instructor(s)**: Andrew Rich, BSME, ACTAR, ASE of Rich Consulting, LLC
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**Registration:** www.Rich-LLC.com/Training