

# Using Microsoft Excel with Advanced Monte Carlo Analysis for Traffic Crash Reconstruction

4-Day Class

ACTAR CEUs Pending

**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.
- This four-day class includes an extra day dedicated to monte Carlo analysis.

**Topics Include:**

- EDR closing speed analysis.
- Calculating EDR cumulative delta-V from acceleration data (Toyota 13 EDR).
- EDR time-distance.
- Spin analysis.
- Conservation of Linear Momentum (“360° momentum”).
- Airborne
- Critical speed yaw.
- User-defined functions. 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.
- Advanced topics in Monte Carlo Analysis including:
  - Handling MCAs that result in non-normal distributions
  - How to write a report that includes an MCA
  - EDR velocity vector MCAs
  - Programming dynamic random numbers and histograms.

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

**Required for class by each student:** A laptop computer running the Office 365 desktop version of Excel\* or Excel version 2016 or later.

**Instructor(s):** Andrew Rich, BSME, ACTAR, ASE of Rich Consulting, LLC  
Michelle Fish-Rich, BSME, ACTAR of Rich Consulting, LLC

**Registration:** [www.Rich-LLC.com/Training](http://www.Rich-LLC.com/Training)

\*A 30-day free trial of Office 365 is available at <https://www.microsoft.com/en-us/microsoft-365/try>