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There are tons of books about measuring, regression analysis and mathematical modeling, but my focus is quite different. I will teach you:

- The world cannot be described by linear models alone, absolutely not! There is a lot of beautiful other functions available!
- Measurement errors should not be neglected.
- Using common sense can make your measurements more precise.
- Finding a pattern in your data is an art; you shouldn't just crunch the numbers, but first of all try to understand what's behind them.
- The traditional least squares regression method (OLS) is flawed in many situations: it's asymmetrical in x and y . I propose a solution: **multidirectional least squares (MDLS)**, which I implemented in a Windows software program, called FittingKVdm.
- Non-linear data transformations to linearize models are not a good idea; iterative methods on the raw data are much more universally usable.
- Judging the "goodness-of-fit" or the usability of a model is really a lot more than just calculating r^2 and p values!
- I analyze many real world examples from all kinds of sciences, from physics to psychology, from biology to economy, from electronics to linguistics. Most of them can be replicated with simple home or classroom experiments or data from public sites. The data files are available.
- To keep it simple, I focus on models with one independent variable in this book. That can be difficult enough! I keep the abstract theory to a minimum; high school and college students who had the basics of calculus and statistics should be able to understand everything. But also teachers and researchers will have a benefit from the 40 years of experience I share, I'm sure.

Koen Van de moortel (°Antwerpen, Belgium, 1962) is a master in experimental physics who worked in research, education (schools and private tutoring), software development and photography.



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