Preface to the Second Edition

Since the first edition of *Measurement Error in Nonlinear Models* appeared in 1995, the field of measurement error and exposure uncertainty has undergone an explosion in research. Some of these areas are the following:

- Bayesian computation via Markov Chain Monte Carlo techniques. The first edition had a short and not particularly satisfactory Chapter 9 on this topic. In this edition, we have greatly expanded the material, and also the applications. Even if one is not a card-carrying Bayesian, Bayesian computation is a natural way to handle what we call the structural approach to measurement error modeling.

- A new chapter has been added on longitudinal data and mixed models, areas that have seen tremendous growth since the first edition.

- Semiparametric and nonparametric methods. The field of semiparametric and nonparametric regression (Ruppert, Wand and Carroll, 2003) has become extremely important in the past eleven years, and in measurement error problems techniques are now much better established. We have revamped the old Chapter on nonparametric regression and density estimation (Chapter 12) and added a new Chapter (Chapter 13) to reflect the changes in the literature.

- Methods for handling covariate measurement error in survival analysis have been developing rapidly. The first edition had a section on survival analysis in the final chapter, “Other Topics.” This section has been greatly expanded and made into a separate Chapter 14.

- The area of missing data has also expanded vigorously over the last eleven years, especially due to the work of Robins and his colleagues. This work and its connections with measurement error now needs a book-length treatment of its own. Therefore, with some reluctance, we decided to delete much of the old material on validation data as a missing data problem.

- We have completely rewritten the score function chapter, both to keep up with advances in this area and and to make the exposition more transparent.
The background material in Appendix A has been expanded to make the book somewhat more self-contained. Technical material that appeared as appendices to individual chapters in the first edition has now been collected into a new Appendix B.

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