

# Preface

This book emerges from my earlier book *Nonlinear Systems*, but it is not a fourth edition of it nor a replacement for it. Its mission and organization are different from *Nonlinear Systems*. While *Nonlinear Systems* was intended as a reference and a text on nonlinear system analysis and its application to control, this book is intended as a text for a first course on nonlinear control that can be taught in one semester (forty lectures). The writing style is intended to make it accessible to a wider audience without compromising the rigor, which is a characteristic of *Nonlinear Systems*. Proofs are included only when they are needed to understand the material; otherwise references are given. In a few cases when it is not convenient to find the proofs in the literature, they are included in the Appendix. With the size of this book about half that of *Nonlinear Systems*, naturally many topics had to be removed. This is not a reflection on the importance of these topics; rather it is my judgement of what should be presented in a first course. Instructors who used *Nonlinear Systems* may disagree with my decision to exclude certain topics; to them I can only say that those topics are still available in *Nonlinear Systems* and can be integrated into the course.

An electronic solution manual is available to instructors from the publisher, not the author. The instructors will also have access to Simulink models of selected exercises. The Companion Website for this book (<http://www.pearsonhighered.com/khalil>) includes, among other things, an errata sheet, a link to report errors and typos, pdf slides of the course, and Simulink models of selected examples.

The book was typeset using L<sup>A</sup>T<sub>E</sub>X. Computations were done using MATLAB and Simulink. The figures were generated using MATLAB or the graphics tool of L<sup>A</sup>T<sub>E</sub>X. The cover of the book depicts one of the first feedback control devices on record, the ancient water clock of Ktesibios in Alexandria, Egypt, around the third century B.C.

I am indebted to many colleagues, students, and readers of *Nonlinear Systems*, and reviewers of this manuscript whose feedback was a great help in writing this book. I am grateful to Michigan State University for an environment that allowed me to write the book, and to the National Science Foundation for supporting my research on nonlinear feedback control.

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