

# Preface

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This book began when David Jacobson wrote the first draft of Chapters 1, 3, and 4 and Jason Speyer wrote Chapters 2, 5, and 6. Since then the book has constantly evolved by modification of those chapters as we interacted with colleagues and students. We owe much to them for this polished version. The objective of the book is to make optimal control theory accessible to a large class of engineers and scientists who are not mathematicians, although they have a basic mathematical background, but who need to understand and want to appreciate the sophisticated material associated with optimal control theory. Therefore, the material is presented using elementary mathematics, which is sufficient to treat and understand in a rigorous way the issues underlying the limited class of control problems in this text. Furthermore, although many topics that build on this foundation are covered briefly, such as inequality constraints, the singular control problem, and advanced numerical methods, the foundation laid here should be adequate for reading the rich literature on these subjects.

We would like to thank our many students whose input over the years has been incorporated into this final draft. Our colleagues also have been very influential in the approach we have taken. In particular, we have spent many hours discussing the concepts of optimal control theory with Professor David Hull. Special thanks are extended to Professor David Chichka, who contributed some interesting examples and numerical methods, and Professor Moshe Idan, whose careful and critical reading of the manuscript has led to a much-improved final draft. Finally, the first author must express his gratitude to Professor Bryson, a pioneer in the development of the theory, numerical methods, and application of optimal control theory as well as a teacher, mentor, and dear friend.