

Preface

The problem of scheduling interactions among satellites and ground stations has been around for decades, and most of the literature tackling this problem has focused on approximate solutions. In this book we have tried to find the optimal solution to this problem and some of its variants and also to unify criteria and notation across the satellite range scheduling literature. To our knowledge, this is the first work that will accomplish both objectives.

We wrote this book as a result of a 2-year (2013–2015) postdoctoral fellowship at the Air Force Research Laboratory, funded by the National Research Council. The major results contained herein were published as a series of conference and journal papers during this period. This work, although based on these publications, considerably extends them by solving new problems and binding them together as a whole.

This endeavor has not been easy, with telecommunication and control engineering backgrounds for tackling a problem from operations research. We think however that this combination provides increased value to this book, and we have in fact tried to make it accessible to those readers that are facing this problem for the first time. This book is also aimed at satellite operations engineers and scheduling algorithm designers, as we here provide reference (optimal) solutions to this problem and some of its most important variants.

We are conscious that we are only scratching the surface on satellite range scheduling, but we have tried to provide a strong framework over which keep finding solutions to more complex problems in this field. We hope this book keeps up with the high standards of previous literature in this field, and more importantly, we hope this book to be useful to students and algorithm designers.

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