

Preface

This book is based on research I undertook for my Ph.D. at the University of Warwick. Its motivation began when, as an undergraduate, I completed a research project on the history of planimeters and mechanical integrators. That project was my first journey into the history of analogue computing, and left me with more unanswered questions than I started with. I wanted to understand the relationship between analogue and digital computing, and what that meant for contemporary users. I found it fascinating that some historians portrayed analogue computing solely as a precursor to digital, whereas others were stressing that analogue computing existed well after 1940. Early on in my research it became clear that historians had different views of the core identity of analogue computing. In fact, it quickly became evident that even within contemporary sources, there was a spectrum of understanding around what constituted analogue computing. It was at that point I began restructuring the history around how the technology was used.

This study investigates the technologies, the concepts, and the applications of analogue computing. It is argued that analogue computing must be thought of as not just a computing technology, but also as a modelling technology. The first half of the book demonstrates how the history of analogue computing can be understood in terms of the two parallel themes of calculation and modelling, and describes how the technology evolved. The second half of the book focuses on a number of detailed case studies: examining analogue modelling in academic research, oil reservoir modelling, aeronautical design, and meteorology. Many of these case studies discuss so-called ‘direct’ analogues—analogue computers that used a direct physical analogy. Because they were not used as *calculators*, direct analogues rarely receive prominence in computing history. However, these were the analogue devices that persisted the longest.

Exploring the history in the context of modelling technology encourages us to see analogue computing in terms of its use. Rather than presenting analogue and digital as alternatives, this approach considers them complementary. The challenge is to not simply consider analogue and digital as separate technologies, but to consider the continuity of practice that spanned the two. This practice was a practice of modelling. This book is not the first account to identify a close relationship between analogue computing and modelling technology. That relationship is evident

in the sources. However, it is my aim to bring that relationship to the forefront of our historiography.

The central thesis is to demonstrate that the history of analogue computing is broader than just the technology or the machines, but must also include how it was used and applied. When we look at the history of analogue computing, we find that different people had different definitions of what analogue meant. Many histories of computing have discussed historical episodes when users debated the relative merits of analogue and digital. However, this book proposes that these ‘debates’ should be framed around application rather than technology. Because the dominant applications of analogue computing were as a modelling technology, the book argues that digital computing only became truly dominant once it too had become a practical modelling tool.

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Technology for Modelling

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