
Preface

... εἰωθότες οἱ ἄνθρωποι οὗ μὲν ἐπιθυμοῦσιν ἐλπίδι ἀπερισκέπτῳ διδόναι, ὃ δὲ μὴ προσίενται λογισμῷ αὐτοκράτορι διωθεῖσθαι.

THUCYDIDIS HISTORIAE IV:108
C. Hude ed., Teubner, Lipsiae MCMXIII

ἽΟι ἄνθρωποι, ἄλλωστε, συνειθίζου νὰ ἐμπιστεύωνται εἰς τὴν ἀπερίσκεπτον ἐλπίδα ἐκεῖνο ποὺ ἐπιθυμοῦν καὶ ν' ἀποκροῦν δι' αὐθαρέτου συλλογισμοῦ ἐκεῖνο ποὺ ἀποστέργουν.

ΘΟΥΚΥΔΙΔΟΥ ΙΣΤΟΡΙΑΙ Δ:108
Κατὰ Μετάφρασιν Ἑλευθερίου Βενιζέλου
Δ. Κακλαμάνος Εκδ.
Σμυρنيωτάκης, Ἀθήνα

It being the fashion of men, what they wish to be true to admit even upon an ungrounded hope, and what they wish not, with a magistral kind of arguing to reject.

Thucydides (the Peloponnesian War Part I), IV:108
Thomas Hobbes Trans., Sir W. Molesworth ed.
In *The English Works of Thomas Hobbes of Malmesbury*, Vol. VIII

I have been introduced to clock design very early in my professional career when I was tapped right out of school to design and implement the clock generation and distribution of the Alpha 21364 microprocessor. Traditionally, Alpha processors exhibited highly innovative clocking systems, always worthy of ISSCC/JSSC publications and for a while Alpha processors were leading the industry in terms of clock performance. I had huge shoes to fill. Obviously, I was overwhelmed, confused and highly confident that I would drag the entire project down. When a few years later

Carl Harris asked me to do a book on clocking for the Springer Integrated Circuits and Systems Series, I readily agreed with the hope that I could save young and aspiring clock designers substantial time and frustration by providing leads and maybe answers to the questions that I had when I was embarking on the Alpha clock design quest. As my choice of opening quotation would suggest, clock design can be a mine-field of misconceptions based on little more than a reluctance to apply Kirchhoff's laws, basic constituent relationships, and a little bit of common sense.

In addition to my personal design experience, the choice of material for this book has been heavily informed by my long tenure in the International Solid-State Circuits Conference (ISSCC) program committee. The subjects covered reflect to a large extent the collective interests and foci of both industry and academia with respect to clocking based on ISSCC submissions. The only exception is that there is no coverage of phase locked loop design since there are a number of recent texts available on this subject matter.

It is my hope that this book will help engineers and students interested in clock design obtain the appropriate mental models and design viewpoints, capture design trends that have appeared over the last few years, and provide a comprehensive list of references for further study. I am indebted to my co-authors for providing precise, structured and complete coverage in their respective chapters in addition to maintaining a viewpoint that is very up to date and highly reflective of current trends in the industry. I hope that the reader will not find "ungrounded hopes" and "magistral arguments" in this book.

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T.X.



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