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Microcomputer System Design

An Advanced Course
Trinity College Dublin, June 1981

Edited by M.J. Flynn, N.R. Harris, and D.P. McCarthy

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PREFACE

The main European tradition is for computer people to be educated in either the software or the hardware side of computing. The Computer Scientist graduates with his knowledge of operating systems, compilers, data structures, etc. and happily enters the field of software and has no contact with computer hardware except as a user. Engineers generally graduate with a knowledge of Electronics and very little knowledge of the software side.

The advent of microcomputers has seen the Computer Scientist trying to increase his hardware knowledge in order to implement systems. It has also seen the Engineer implementing large systems using assembly language or struggling with interfaces to operating systems and high level languages. It is now evident that in order to use microcomputers effectively system designers require a broad knowledge of computer hardware, interfacing, software, and design tools.

Because of this we proposed a microcomputer system design course which would integrate the hardware and software sides of microcomputers and bring together academics/practitioners from both disciplines. In 1979 a course proposal was made to the National Board of Science and Technology (N.B.S.T.) Ireland and to the Informatics Training Group of the EEC Scientific and Technical Research Committee (CREST). The proposal was enthusiastically received and supported.

Lecturers were chosen to cover the main areas of the syllabus and during the last week of September 1980 a week-long meeting took place in County Wicklow for the detailed planning. It was agreed that the syllabus should "span development from silicon technology to software and should bring together current techniques in LSI/VLSI design, computer structures and languages and show their application to, and implication for, microcomputer system designs". A detailed syllabus was prepared resulting in this set of course notes.

The course ran in July 1981 and had approximately 75 attendees from ten countries whose enthusiasm and interest made the program all the more interesting for all. A preliminary version of these notes was published at Trinity College for use in the course. This Springer-Verlag edition includes revisions based on presentations, corrections and some new material.

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- the National Board of Science and Technology for their financial sponsorship, advice and encouragement. In this regard special thanks are due to Dr. B. O'Shea.
- the lecturers for their full co-operation during the preparatory seminar, planning of the course, and submission of course notes and the course itself.
- Mrs. Janet Hogan, our Administrative Secretary, for her cheerful organisation of these course notes and her efficient, willing administration of the course.
- Professor J. G. Byrne, Head of Department of Computer Science, Mrs. H. Smith and Miss Susie Pakenham-Walsh, and to all the members of our staff who have helped in the organisation of this course.
- Prof. F. Sumner of the University of Manchester who provided early council on the course organization and lecturers. Events conspired to prevent him from a later, more direct involvement with the course.
- The course presentation was assisted by the use of several video taped lectures originally presented at Stanford University. We are grateful to the Stanford Computer Systems Laboratory for making these available and to the TCD Communications Centre for use of its video facilities during the course.

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