CISC260 Machine Organization and Assembly Language

CISC 260 Machine Organization and Assembly Language

Spring 2018

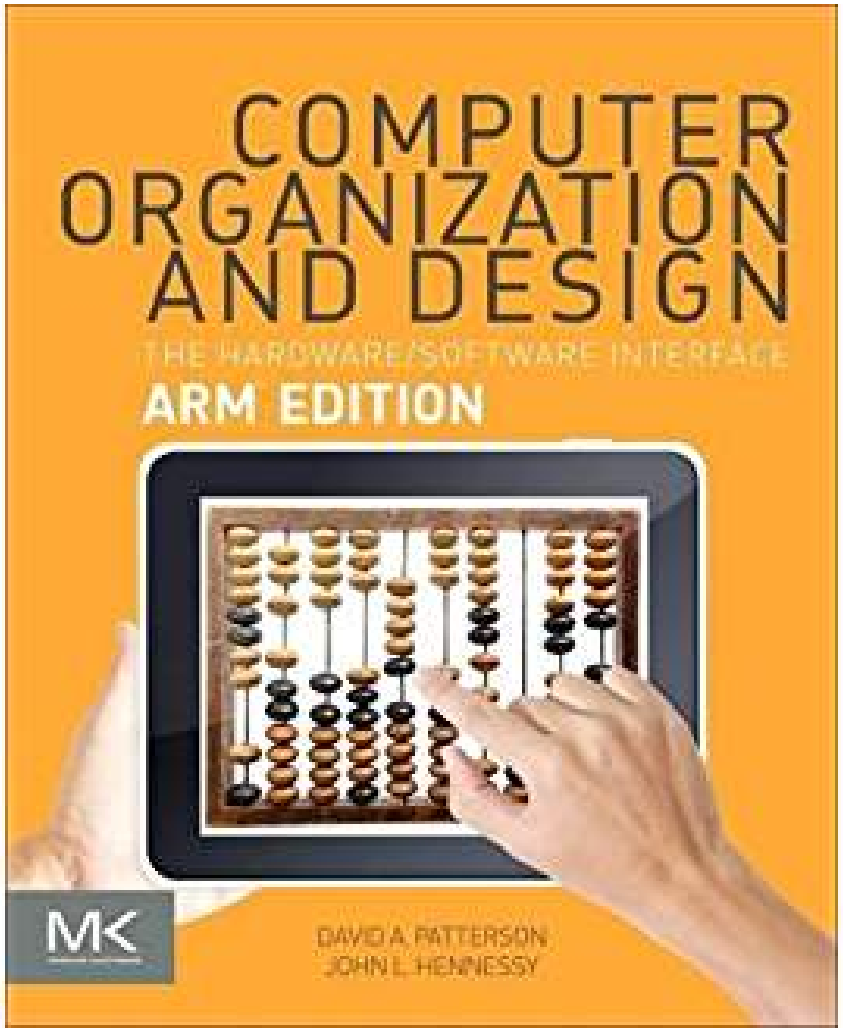
Time & Place: 9:30AM-10:45AM, TR, Willard Hall 006

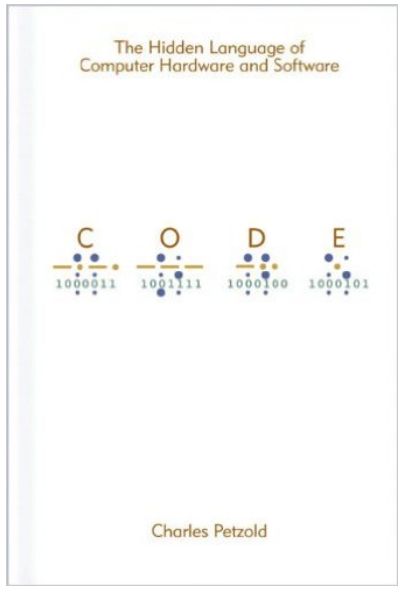
Instructor: Li Liao (Smith 424, 831-3500, liliao@udel.edu), Office Hours: 11:00PM-12:00PM Tuesdays and Thursdays or by appointment

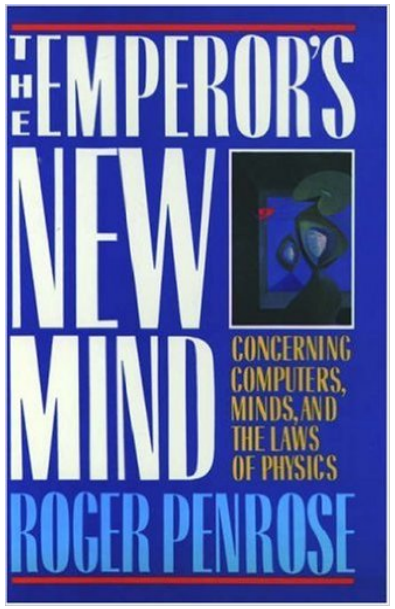
TA: Jiefu Li, (Smith 201, lijiefu@udel.edu), Office Hours: 10AM-11AM, Wednesdays; 2-3PM, Thursdays.

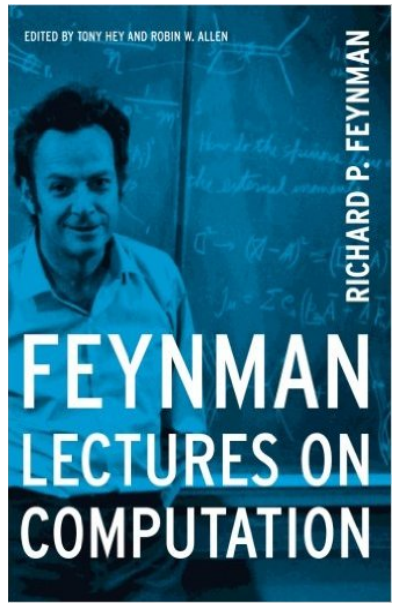
Course Catalog Description:

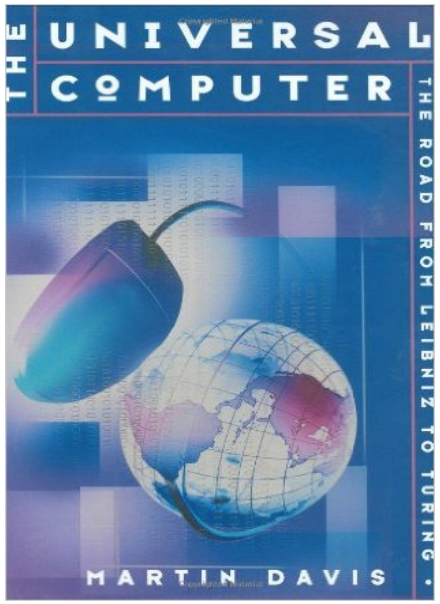
Introduction to the basics of machine organization. Programming tools and techniques at the machine and assembly levels. Assembly language programming and computer arithmetic techniques.

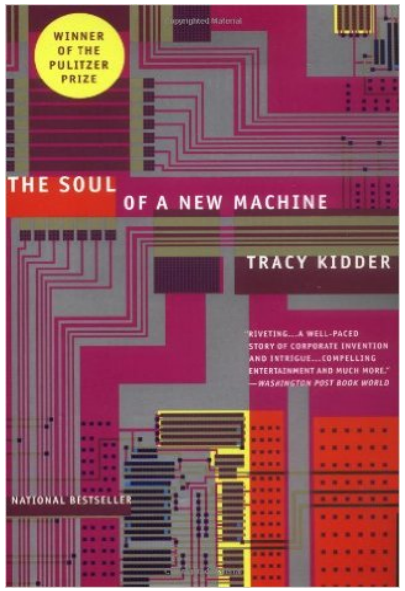

COMPUTER ORGANIZATION AND DESIGN
THE HARDWARE/SOFTWARE INTERFACE
ARM EDITION
MK
DAVID A. PATTERSON
JOHN L. HENNESSY

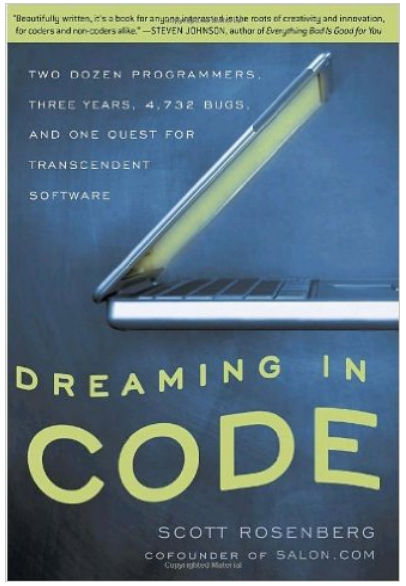

The Hidden Language of
Computer Hardware and Software
C O D E
1000011 1001111 1000100 1000101
Charles Petzold

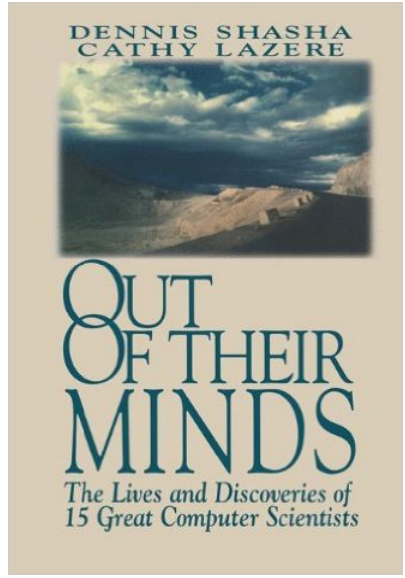

THE EMPEROR'S NEW MIND
CONCERNING COMPUTERS, MINDS, AND THE LAWS OF PHYSICS
ROGER PENROSE


EDITED BY TONY HEY AND ROBIN W. ALLEN
RICHARD P. FEYNMAN
FEYNMAN LECTURES ON COMPUTATION


THE UNIVERSAL COMPUTER
THE ROAD FROM LEIBNIZ TO TURING
MARTIN DAVIS


WINNER OF THE PULITZER PRIZE
THE SOUL OF A NEW MACHINE
TRACY KIDDER
NATIONAL BESTSELLER

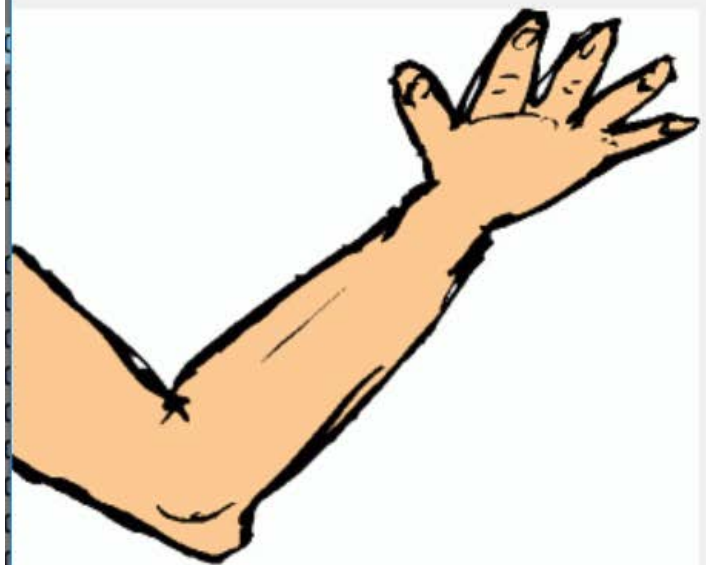

TWO DOZEN PROGRAMMERS, THREE YEARS, 4,732 BUGS, AND ONE QUEST FOR TRANSCENDENT SOFTWARE
DREAMING IN CODE
SCOTT ROSENBERG
COFOUNDER OF SALON.COM


DENNIS SHASHA
CATHY LAZERE
OUT OF THEIR MINDS
The Lives and Discoveries of 15 Great Computer Scientists


8 ACADEMY AWARD® NOMINATIONS 2014
BENEDICT CUMBERBATCH
KEIRA KNIGHTLEY
THE IMITATION GAME
"BEST FILM OF THE YEAR"

About ARMSim#

ARMSim - the ARM Simulator



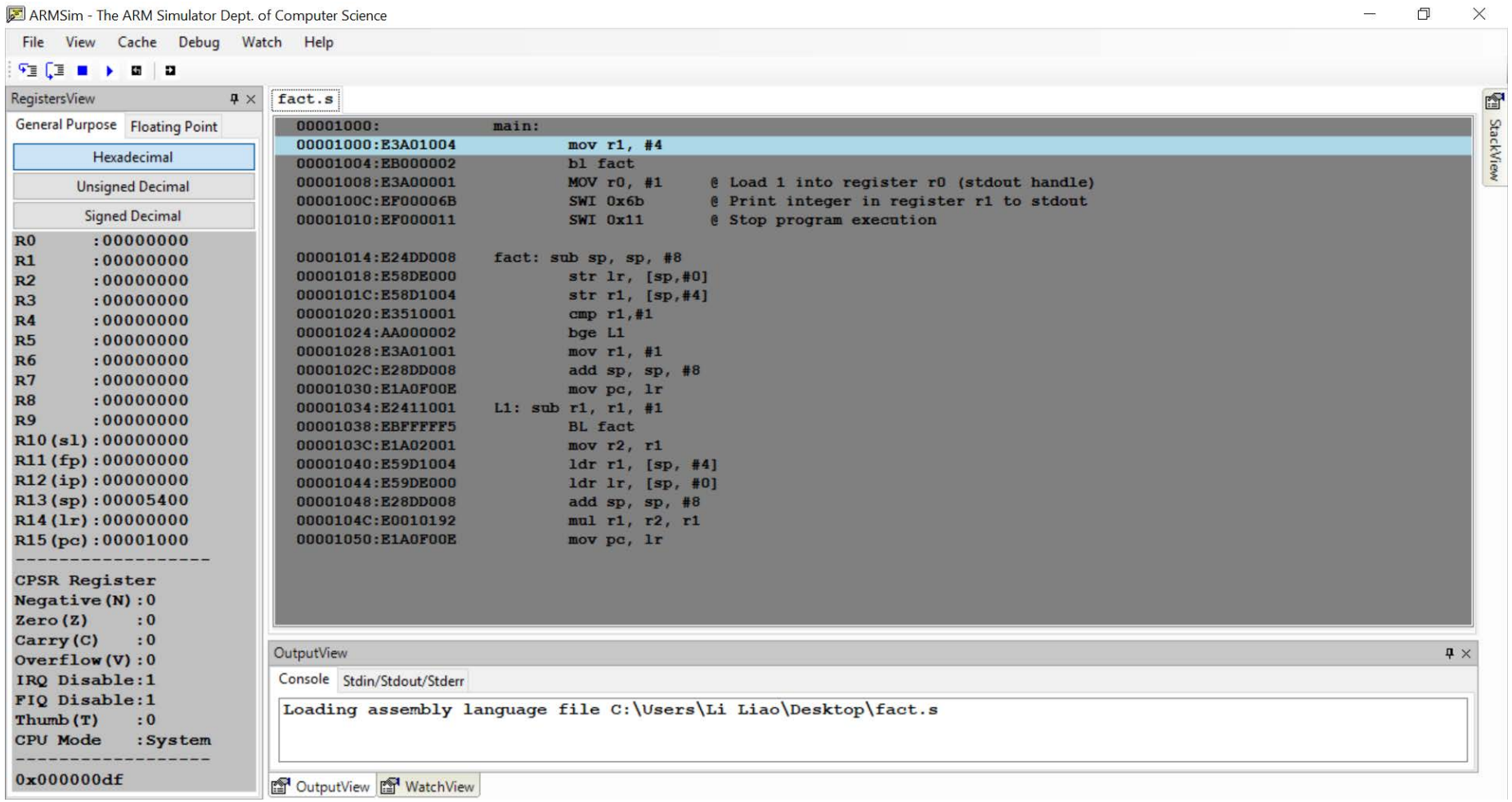
ARMSim# Version 1.9.1 (20500)

University of Victoria
Produced by:
Dr. Nigel Horspool
Dale Lyons
Dr. Micaela Serra
Department of Computer Science.

Simulating ARMv5 instruction architecture with Vector Floating Point support and a Data/Instruction Cache simulation.

Docking Windows provided by:

Crownwood Software


ARMSim - The ARM Simulator Dept. of Computer Science
File View Cache Debug Watch Help
RegistersView
General Purpose Floating Point
Hexadecimal
Unsigned Decimal
Signed Decimal
R0 :00000000
R1 :00000000
R2 :00000000
R3 :00000000
R4 :00000000
R5 :00000000
R6 :00000000
R7 :00000000
R8 :00000000
R9 :00000000
R10(sl):00000000
R11(fp):00000000
R12(ip):00000000
R13(sp):00005400
R14(lr):00000000
R15(pc):00001000
CPSR Register
Negative(N):0
Zero(Z) :0
Carry(C) :0
Overflow(V):0
IRQ Disable:1
FIQ Disable:1
Thumb(T) :0
CPU Mode :System
0x000000df
fact.s
00001000: main:
00001000:E3A01004 mov r1, #4
00001004:EB000002 bl fact
00001008:E3A00001 MOV r0, #1 @ Load 1 into register r0 (stdout handle)
0000100C:EF00006B SWI 0x6b @ Print integer in register r1 to stdout
00001010:EF000011 SWI 0x11 @ Stop program execution
00001014:E24DD008 fact: sub sp, sp, #8
00001018:E58DE000 str lr, [sp,#0]
0000101C:E58D1004 str r1, [sp,#4]
00001020:E3510001 cmp r1,#1
00001024:AA000002 bge L1
00001028:E3A01001 mov r1, #1
0000102C:E28DD008 add sp, sp, #8
00001030:E1A0F00E mov pc, lr
00001034:E2411001 L1: sub r1, r1, #1
00001038:EBFFFFF5 BL fact
0000103C:E1A02001 mov r2, r1
00001040:E59D1004 ldr r1, [sp, #4]
00001044:E59DE000 ldr lr, [sp, #0]
00001048:E28DD008 add sp, sp, #8
0000104C:E0010192 mul r1, r2, r1
00001050:E1A0F00E mov pc, lr
StackView
OutputView
Console Stdin/Stdout/Stderr
Loading assembly language file C:\Users\Li Liao\Desktop\fact.s
OutputView WatchView

CISC260 Tentative Schedule (S18)

#	Week	Topic
1	Feb5	Overview and Data representation
2	Feb12	Boolean logic, gates
3	Feb19	Build a simple computer
4	Feb26	ARM, ISA, Assembly Language
5	Mar5	Assembly programming
6	Mar12	Procedure call, stack
7	Mar19	Assembly programming and Review1
		Midterm March 22
8	Mar23	Spring break (no classes)
9	Apr2	Floating point
10	Apr9	Assembly programming: Dynamic data structure
11	Apr16	Assembler, Linker, Compiler (Nov.8 Election Day. no class)
12	Apr23	Performance and optimization
13	Apr30	I/O
14	May7	Assembly language programming and security
15	May15	Review2