Debugging in C
Show how to implement
   Heart beats
   Counters
   LEDs
   Scopes
Dumps
   Store into buffer
Profile
   Record time sequence of execution pattern
   Logic analyzer

Embedded Systems Products

- Speech encoder/decoder in cell phones
- Audio decoder in MP3 players
- Audio compensator in a hearing aid
- Image/video encoder in digital still cameras
- Anti-locking braking system
- Engine control system
- Navigation system in autonomous vehicle

Embedded Systems Area at UT Austin

- Which courses are most relevant & important?
  EE 445L for components (EE306+EE319K)
  EE 345M for systems (EE445L and EE322C)
  EE 445S for DSP applications (EE319K+EE313)
  EE 360R for digital IC design (EE316)
- What are important technical challenges today?
  Time-to-market;
  Maximizing use of Moore’s law
  -number of transistors/chip doubles every 2y
- What industries/companies need these skills?
  Any company making super high volume products
- How do I prepare for graduate school?
  Take EE 460N Comp. Arch. and EE 360C Algorithms

Jonathan W. Valvano
Take classes from professors with active research programs
Teach your professor your name
Get involved in undergraduate research

EE445L Labs
Lab 1e. ASCII to fixed-point conversions (unsigned 0.01)
Lab 2g. Debugging, oscilloscope fundamentals, logic analyzer, dump profile
Lab 3f. Alarm clock, LCD, key wakeup, and Output Compare interrupts
Lab 4h. Stepper motor, output compare interrupts, finite state machine
Lab 5h. 12-bit DAC, SPI, Music player, audio amp
Lab 6h. Introduction to PCB Layout, PCB Artist (paper design only)
Lab 7f. Temperature measurement, ADC, LCD
Lab 8g. Prototype Hardware and Layout of an Embedded System
Lab 9. Software I/O Drivers for an Embedded System
Lab 10g. ZigBee, SCI, distributed systems, level conversions
Lab 11b. Final Design and Evaluation of Embedded System

EE345M Laboratories
Lab 1. Real-time clock, LCD, ADC and serial Arm Cortex-M3
Lab 2. Real-time operating system kernel (thread switching and synchronization)
Lab 3. Blocking semaphores, priority scheduling, dumping RTOS profile data to the PC
Lab 4. Microphone input, digital filters, FFT, display spectrum on LCD
Lab 5. Solid state disk, SPI, address translation, layered software, file system
Lab 6. Distributed data acquisition using a controller area network (CAN)
Lab 7. Formula 0001 Racing Robot (teams of 3, 4 or 5)