

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

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)