Hardware-Based Solutions for Real-Time Operation

ESE3025

the embedded SoC

The embedded <u>S</u>ystem-<u>o</u>n-a-<u>C</u>hip consists of many components, several of which are not found on desktop microprocessor chips:

- main core(s): typically ARM-based, Ax- or Mx- cores, sometimes with FPUs
- tightly-coupled memory: high-speed RAM used for cache
- supplemental cores: simpler cores, usually without FPUs
- various peripherals: ADC/DAC, PWM generators, I2C/SPI/UART/CAN bus controllers
- lots of interconnect!

Beaglebone's Sitara SoC PRUSS/PRU-ICSS

- contains two simple 32-bit proprietary RISC cores comprising the Programmable Real-time Unit and Industrial Communication Sub-system (PRUSS).