Inter-task communication and synchronization in the hard real-time compact kernel HARETICK

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ABSTRACT

HARETICK is a hard real-time compact operating kernel designed specifically to support critical applications on DSP and embedded platforms including intelligent sensor networks and robotic environments. It provides operating support for both hard real-time and soft/non real-time tasks. The hard real-time task execution context is based on non-preemptive mechanisms. This paper focuses on the inter-task communication and synchronization techniques involving the two types of tasks previously mentioned. As a case study, a highly predictable synchronous serial communication (i.e., SPI) interface implemented on an ARM7-based HARETICK platform, is presented and discussed, along with some of the most interesting experimental results.

INDEX TERMS

• INSPEC
  ◦ Controlled Indexing
digital signal processing chips, intelligent sensors, real-time systems, synchronisation, telecommunication computing, wireless sensor networks
  ◦ Non Controlled Indexing
DSP, embedded platforms, intelligent sensor networks, intertask communication, real-time compact kernel HARETICK, synchronization techniques

• Author Keywords
HARETICK, Inter-process communication, hard real-time, synchronization