Multi-threaded processor for space applications

This talk will present the results of a feasibility project (ITI Type B) which has implemented a prototype of a multithreaded processor for applications where multi-core may provide a unified solution to the typically, two different kinds of on-board computers are used in spacecraft; namely platform computers and payload computers. The objective of the project was to demonstrate whether the future for both lies in general-purpose processors or GPPs,

This project follows a successful ITI Type A project, in which Techne extended work originally undertaken in the European Apple-CORE project. Because of the convincing results obtained, we have now implemented a prototype core in FPGA technology. The presentation will consider the implementation, the software platform and changes made to both in this iteration of the work and present an evaluation of the technology.

It should be noted that one of the significant benefits of the technology is the fact that once recoded for multi-threaded execution (a process that is also evaluated), the same binary code can be targeted to any number of cores to achieve the desired throughput for the application at hand. We believe therefore that this technology has the potential to bridge the gap between platform computers and payload computers.