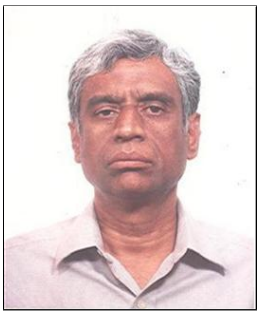

Prof. P. S. Thiagarajan

Prof. P. S. Thaigarajan is a professor in the school of computing of National University of Singapore. He served two terms (1997 - 2003) as a member of the Governing Council of the European Association for Theoretical Computer Science (EATCS). He is a Fellow of the Indian Academy of Sciences and the Indian National Academy of Sciences. His current research interests are: System-level design methods for embedded systems, real time and hybrid systems and computational systems biology. He visited IIT Kanpur from May 1-6, 2006.

1 Research collaboration and related activities

During this visit he engaged principally in research discussions with Prof. Manindra Agrawal and Prof. Anil Seth on topics in Hybrid Automata and Logic. He also gave a seminar on his work. Hybrid Automata are used to model digital control of continuously evolving systems, e.g., chemical plants. One of the most important questions here is that given such an automata, how one certifies that it correctly controls the plant. In an earlier work, Professors Thaigarajan and Manindra Agrawal had shown how to do this certification for certain types of automata. The discussion this time centered on trying to enlarge the class of automata for which certification is possible. With Prof. Anil Seth, Professor Thaigarajan worked on designing a logic to reason about (temporal) behavior of objects in such interacting process classes. After making the semantics of this logic precise, they quickly found that such logics have undecidable satisfiability and model-checking problem. Then they started work on some variants of these logics which may have decidable model-checking problem. Professor Thiagarajan also gave a talk on Interacting Process Classes. These are classes of interacting objects in reactive control systems where the objects belonging to a class exhibit similar behavior. He proposed a modeling and simulation technique for interacting process classes. Control flow in a process class is captured by a labeled transition system and unit interactions by MSCs. The execution semantics in the proposed approach leads to a symbolic simulation technique which is both time and memory efficient.