

Research history of Leo Motus

Majority of my research results have been finally mapped into reports, articles, books, and conference papers in two institutions – Institute of Cybernetics (1964 - 1992), and Tallinn University of Technology (1992 – today). However, the problems, and ideas for resolution of the problems stem from many different people in many different countries of the world. I am really grateful to my fellow-researchers and colleagues, wherever they are and whatever they are studying at this moment.

Quick survey of key issues

1964 – 1992	Institute of Cybernetics, Estonian Academy of Sciences: researcher, senior researcher, and project manager. Main research topics for this period have been: <ol style="list-style-type: none">1. Solution of a stopping rule problem by solving partial differential equations with free boundary (applied for sub-optimal real-time control of non-linear stochastic systems with incomplete information).2. Design and development of a real-time operating systems' family MEDEX; its application in a control system for urea production process, and in on-line software system for seabed geological research.3. Research of theoretical foundations for a prototype of time-sensitive interaction-centred model of computation (the Q-model) in order to enable formal timing analysis of interactions in software and systems.
1992 – today	Tallinn University of Technology: professor (up to today), dean (1994-2001) of the Faculty of Systems Engineering. Main research topics for this period have been: <ol style="list-style-type: none">1. Elaboration of the time model to be used in specification, design, and implementation of software.2. Methods and tools (based on the Q-model) for formal verification of time-constraint concurrent software (LIMITS).3. Study of real-time software specification and design methods that support timing analysis – e.g. enhancing UML with attributes and properties enabling full-scale timing analysis, linking UML with other tools (e.g. LIMITS plus IDE/OMT, LIMITS plus Artisan Real-time Studio).4. Timing analysis of interactions and emerging behaviour in time-aware multi-agent systems, and related problems (e.g. interactive ontology and its relation to machine learning and adaptability).

Some subjective comments

1. I started my career at the Institute of Cybernetics 18 months before graduation Tallinn University of Technology, so my graduation paper (on machine learning, in particular experimental study of reinforcement learning algorithms) was supervised and inspired by my new colleagues.
2. Since 1996 I have been occasionally consulting the non-academic world – for instance, modernisation issues of control systems for power plants (IRU power plant, Eesti power plant), and auditing and/or design of software systems (information system of Estonian Parliament).



A typical working lunch in a village restaurant near Hong Kong