

Theoretical points of view to future simulation environments



Simulation, simulator and training simulation

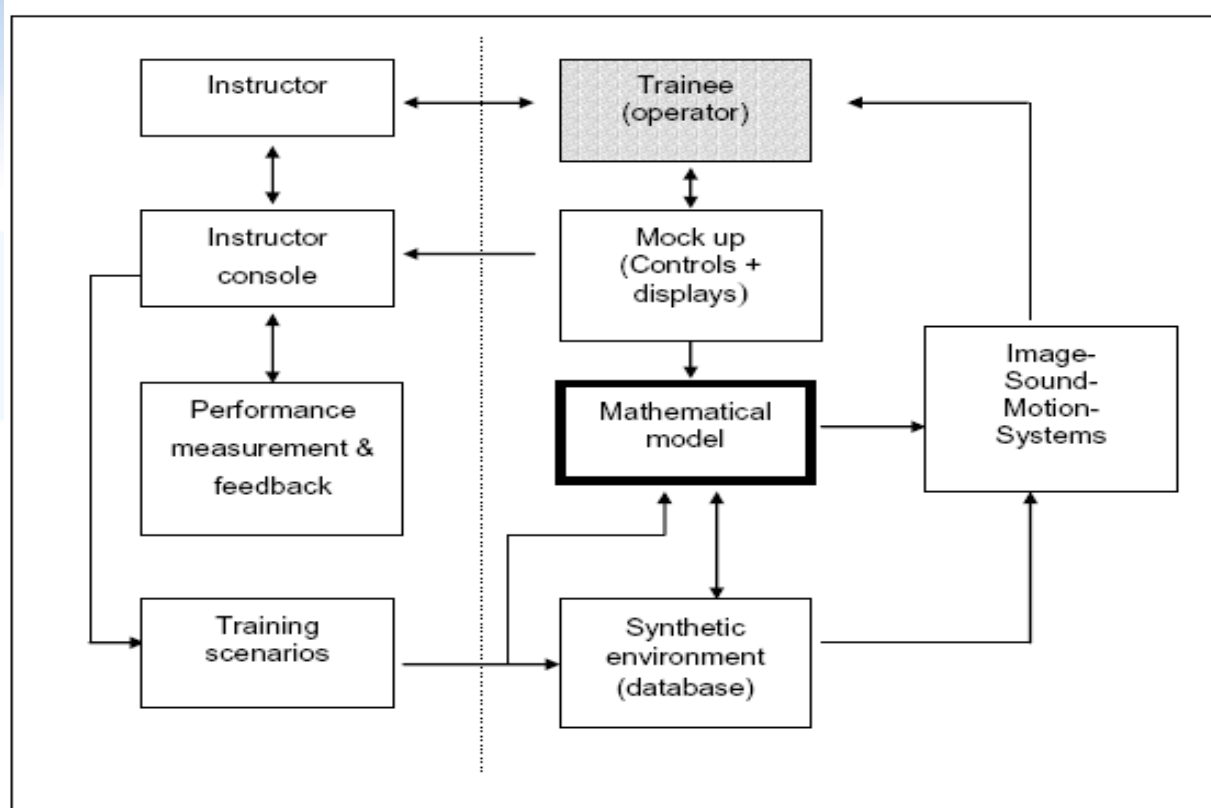
- Simulation means imitating, reproduction of some biological, physiological, medical, social or technical system or a part, combination or interaction of these. (Vartiainen 1985)
- Simulator means any device or system that simulates specific conditions or the characteristics of a real process or machine for the purposes of research or operator training. (MOT dictionary)
- Some added values of simulator-based training
 - Safety
 - Repeatability of the exercise
 - Cost effectiveness
 - Possibility to manage and tailor training
 - Evaluation of the students skills
 - Automation of the training and quiding



Pictures: Maritime simulator Aboa Mare, ENVI- medical simulator. www.envi.fi



Basic technical structure of simulators



Ref. van Emmerik (2004)
Beyond the simulator. Instruction for high-performance tasks

Pictures: Harvester simulator,
Drilling rig simulator,
Sandvik Mining and Construction Oy,

Simulator offer tools to educational processes

- The simulated environment should be an integrated part of the whole instructional context.
- Management of instructional processes based on the context.
- Curriculum supports a construction of simulated environment
- Powerful tool for get safe experience of instructionally meaningful cases (scenarios)
- Possibility to repeat, reflect and examine simulated events, episodes and scenarios
- Development of psycho-motoric, perceptual, decision-making and participation skills
- Possibility to get rich analysed information (process data) of action (events) for an assessment (debriefing)
- Need of educated instructors and supportive employees



Simulators in the future

- Intelligent educational system
- Augmented virtual reality with appropriate multimodalities (senses)
- Integration of dynamic simulations, domain ontologies (conceptual model)
- Virtual laboratory tools for comparing different solutions
- Profiling and monitoring tools of competence development
- Collaborational problem solving tools in shared virtual environment
- Simulated ubiquitous computing in real environment



Picture: Intelligent and Virtual Learning Environment for Mechanics of Forest Machine

Discussion

- Thank you very much of attention
- Questions and comments

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