Doctoral School of Information and Biomedical Technologies Polish Academy of Sciences

Domain: IT

SUBJECT: Automatic generation/modification of maintenance schedules of technical systems on the basis of real-time operational data

Supervisors, contact: dr hab. Jacek Malinowski (Jacek.Malinowski@ibspan.waw.pl)

Assistant supervisors, contact:

Place of research: Systems Research Institute

Recruitment & Selection: Interview

Number of positions: 1

Project Description

Maintenance scheduling is an essential factor for the proper functioning of small or large-scale technological systems, from single devices for individual use like motorcars or household appliances to complex industrial facilities like power stations, steel plants or railway networks. Due to the system complexity and/or limited ability of a maintenance planner to react to unexpected events, human-prepared maintenance schedules may be insufficiently effective, leaving room for improvement. The research object is a model a complex technical system whose components are subject to gradual degradation, mutual harmful impacts and external adverse factors, all resulting in failures or damages. In order to reduce the possibility of such occurrences and minimize the system operating cost, a schedule of inspections, repairs and replacements is implemented. The modeled system complexity, limited number of personnel entailing the need to set up maintenance queues, the inter-component dependencies (failure or damage of one component may cause failures, damages or increased degradation of other components), random nature of both intrinsic failures and external impacts, are the factors determining the choice of the method to find the optimal maintenance plan. Roughly, this method should combine the simulation of the modeled system behavior with non-analytical optimization. Its development will be the task of a doctoral candidate.

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