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Project Title: Feasibility study of using soft sensors in the electrical industry

Department:	Instrumentation Networks	Employer:	Niroo Research Institute
Project/Program Manager:	Maryam Amirabadi	Executor:	Babak Amini
Project Financial Code:	510001	Project Quality Code:	PCNPN39
Type of Project/Program:	Feasibility project	Assistant:	Research Assistant

Project Staff: Babak Amini and Mahsa Alaei

Keywords:

Soft sensors, Model-based sensors, Data-based sensors, White box, Black box, Gray box, Model development methodology, Development algorithms

Project Necessity:

New and important topics and technologies in the world, such as the design and implementation of soft sensors, need to be monitored and their progress and upward trend should be considered in order to benefit from research ideas at the university and industry levels.

Project Goals:

- Introduction of soft sensor and its applications in the country's electricity industry
- Monitoring technology around the world by reviewing citation databases and studying reputable journals and presenting suggested research ideas

Abstract:

In this project, the concepts, types and methods of soft sensor were introduced and then the applications of soft sensors in industries, especially the electricity industry were examined. To do this, the Scopus database, related articles and journals from 2014 to 2020 were reviewed. In this regard, more than 400 reputable journals were reviewed, and after refining them by year, validity and application in the electricity industry, the abstracts of selected articles were studied in more detail. According to studies and searches, soft sensors are widely used in the electrical industry, especially in the field of production, and can be very effective in measuring parameters, process monitoring and error detection. In power plants, we can measure parameters such as the concentration of greenhouse gases and flue gas output, flow rate of water feeder pump, temperature measurement, moisture content and viscosity of fuel, flow rate of the pump,

etc. According to the types of projects that can be done in the research groups of Niroo Research Institute, related research ideas were identified and categorized. The identified ideas include 41 proposed research project titles. These project proposals are presented in the form of 3 titles of feasibility projects, futures research and standard development and 38 titles of idea testing projects, and based on the thematic branches of online parameter forecasting, process monitoring and error detection in soft sensor implementation.

Steps and Methodologies:

- Introduction of soft sensor
- Development methodology, implementation algorithms
- Soft sensor applications in the electrical industry
- Current status of soft sensors worldwide
- Provide suggested research ideas

Main Results (technical outputs, patents, papers, books, reports, etc.):

- Preparing a technical report of the work process and the results