Abstract of Main Thesis

Title of Thesis

Hybrid Intelligent Decision Support Systems for Selection of Alternatives in Stock Trading

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Abstract on the Content of the Applicant's Thesis

The dissertation presents Hybrid Intelligent Decision Support Systems (DSS) for the selection of alternatives (companies, stocks, and company groups) in stock trading under uncertainty. This study proposes a framework that includes three models using Hybrid Intelligent DSS. The framework aims to optimize trading decisions in the selection of appropriate alternatives and reduce risky decisions.

This framework is used to quantify qualitative attributes and normalize quantitative attributes of alternatives, together with expert preferences and sensibilities under uncertainty for the selection of alternatives and reducing risks in stock trading. To validate the performance of this framework, the proposed models in the framework have been tested and performed objectively by multiple experts in real-world stock trading through experiments in case studies on the HOSE, HNX and NYSE and NASDAQ stock markets.

In this framework, the first model, called a Hybrid SOM-AHP model, is a Self-Organizing Map (SOM) integrated with Analytic Hierarchy Process (AHP). This model aims to select short-list investment alternatives in rankings for stock trading. Experimental results of this model showed average rates from 68% to 70% in stock selection for successful investment. The second model, called Hybrid *Kansei*-SOM (HKS) model, is integrated by SOM with *Kansei* evaluation for quantifying expert sensibilities in trading decisions. The experimental results showed that the HKS model obtained successful stock selection rates from 81% to 85% in investments. The third model, called Hybrid *Kansei*-SOM Risk (HKSR) model, aims to reduce risky decisions and alternative risks. Compared to the HKS model, HKSR model reduced risky stocks from 3% to 5% in investments better than that of the HKS model. Compared with Rule-based Evidential Reasoning (RER) model under the same market conditions, HKS and HKSR models selected successful stocks at rates of 10% to 15% higher than that of RER model. In overall evaluation, the proposed framework using Hybrid Intelligent DSS was able to show successful selections of appropriate alternatives and reduction of risky decisions.