

## Executive Summary

# Rough Sets with Multiple Targets and Their Approximation Calculations

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Numerous common processes, including as classification, clustering, feature selection, and attribute reduction, have extensively used rough set theory. Numerous works have been introduced based on various generalizations of the rough set model. In terms of feature selection, rough set theory can be compared to several cutting-edge techniques. These studies focus on the single-label learning paradigm, sometimes known as classic machine learning, in which there is only one label or decision in the learning task. Since real-life applications frequently have many labels, this learning paradigm has severe limitations. This study suggests a basic set model with multiple target concepts that considers the relationships of similarity between target concepts to capture label correlation between labels.

Calculating the approximations is an old, classic, but significant topic in rough set theory. Many academics have been paying close attention in recent years to the computation and updating of multi-granular coarse sets and their extended models. According to the change scenarios in the data sets, these studies are typically separated into four categories: increasing or decreasing attributes, changing attribute values, changing decision attributes, and altering object set modifications. In rare circumstances, a target notion may be incorporated into the target group. It is more effective to compute the approximations using the current findings as opposed to recalculating them for the entire universe with all goals. In this part, authors present some findings resulting from the inclusion of a target set in the target group.

A novel multi-target rough set model that can address multi-label issues is presented in this work. To manage numerous target sets, this model also includes label correlation into rough set theory. We look at the suggested model's characteristics before offering a method for estimating the model's approximation. Experiments verify the proposed approximation computation approach.

The attribute reduction strategy based on the positive region idea of rough set theory requires computation of approximations as a crucial step.

Source: [Information](#)

## KEYWORDS

Rough sets; multi-label learning; calculating approximations; dynamical computing; label correlation

