LAPORAN SKRIPSI

LIGHTWEIGHT STEREOTYPE-BASED COLD-START MITIGATION IN E-LEARNING VIA AHC AND DECISION TREE

SEBASTIAN AMADEUS DIAZ BUDIJONO

22.K1.0022

TEKNIK INFORMATIKA

ILMU KOMPUTER

UNIVERSITAS KATOLIK SOEGIJAPRANATA

SEMARANG

2026

LAPORAN SKRIPSI

LIGHTWEIGHT STEREOTYPE-BASED COLD-START MITIGATION IN E-LEARNING VIA AHC AND DECISION TREE

Diajukan dalam Rangka Memenuhi

Salah Satu Syarat Memperoleh

Gelar Sarjana Komputer



SEBASTIAN AMADEUS

DIAZ BUDIJONO

22.K1.0022

TEKNIK INFORMATIKA

ILMU KOMPUTER

UNIVERSITAS KATOLIK SOEGIJAPRANATA

SEMARANG

2026

Penulisan halaman mengikuti ketentuan format penulisan Prodi

ABSTRACT

E-learning platforms are new parts of education this decade, but their recommender systems often fail new users never interact with these apps previously, and the problem is called 'Cold Start'. This heavily affects the dropout rate of course enrollments, which leads to poor opinions. To address this critical gap, this study introduces a lightweight, stereotype-based recommendation system designed to deliver immediate, personalized content. Our approach bypasses the need for interaction history by leveraging explicit user attributes collected during sign-up, such as age, educational background, and learning goals. We employ a two-stage methodology. First, we use Agglomerative Hierarchical Clustering (AHC) with Gower Distance and Ward's method on a public MOOC dataset to identify and form distinct user "stereotypes" based on shared attributes. This process ensures that clusters, that are just made, are unique and very different each other. Second, a Decision Tree classifier is trained on these stereotypes. When a new user joins, the decision tree, with its own trained rules, put the new user into good and fitting stereotype, then provide suitable courses inside the stereotype. This hybrid model offers an efficient, interpretable, and scalable solution to the cold-start challenge, significantly keeping the best user experience without any heavier methods or algorithm.

Keywords: Recommender System, Cold-Start Problem, E-Learning, Stereotype-Based, Hierarchical Clustering, Decision Tree