PGD/M 11

Subject Stream Prediction: A Machine learning Approach to Select the Suitable Subject Stream for Senior Secondary Students in Sri Lanka

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I certify that I have read this thesis and that in my opinion, on it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

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DECLARATION

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ABSTRACT

Education is an important factor that measures the nation's wealth and directly affects the country's future development. According to the Sri Lankan government, free education provides to students at all levels up to the university level. General Certificate of Examination (Ordinary Level) – G.C.E.(O/L) and General Certificate of Examination (Advanced Level) – G.C.E.(A/L) are essential exams that complete senior secondary education. G.C.E.(A/L) is the examination that causes one to enter a university for higher education. According to the Sri Lankan education schemas, students happen to select one subject stream and related subjects relevant to that subject stream to continue their senior secondary education key stage 2. That selection is caused to the students' whole lives because students happen to face G.C.E.(A/L) from that subject stream. Most of the students have taken this decision according to the force of someone or comparing it with their own. I think it may be caused to break the senior secondary education key stage (2) in the middle or change the subject stream in the middle. These kinds of reasons affect to keep away the students from their target careers. From my point of view, students should pay attention to O/L results and their inborn talents, skills, and relevant working field that they hope for their job when selecting the subject stream for continuing their senior secondary education. I have developed a machine learning model to suggest the best subject stream based on the above features. The implemented model which is called the SubjectStreamPredict system predicts the best subject stream for students. As well as the implemented model suggest another suitable ten solutions including an appropriate career path according to the user's input values.

To implement the model, I have trained and tested four machine learning algorithms: K-Nearest Neighbors, Decision Tree, Random Forest, and Support Vector Machine Algorithm for the same data set. The Random Forest algorithm outperformed other algorithms and gave high accuracy (0.70). According to the analysis results I implemented my model using Random Forest Classifier algorithm and I improve the output generated from Random Forest by predicting more than one feature.

Keywords –Machine Learning Algorithm, Subject Stream, Prediction System

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