

# **ADAPTIVE GAMIFICATION FOR LEARNING PROGRAMMING**

**Aravinthan Sathasivam**

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**Department of Computing**

**Informatics Institute of Technology, Sri Lanka**

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## Abstract

Programming is considered an important skill for students who are seeking a career in the field of computer science and information technologies. According to various research, learning programming is one of the most difficult and complex tasks to accomplish. A high rate of failures and dropouts are obtained in programming courses because students have often experienced difficulties in adapting theoretical concepts and finding motivation. The need for new methods to solve these difficulties leads to gamification approaches.

In recent times the expectation of gamification has climbed up to a new level of functionality, approachability, and life integration. Applying game-based dynamics, game logic, and aesthetics to solve problems, motivate progress, encourage learning, and engage people is defined as Gamification. In the educational sector, Gamification is becoming a catchword. More recently another term called adaptive gamification is also trending. It is the next step towards the advancement of gamification.

This research tries to obtain a novel adaptive gamification approach of learning basic programming concepts as a solution to solve identified learning-related problems. Also, the implemented game uses a simple decision tree machine learning model to predict user's rewards based on their performances and direct the users to relevant game levels. The game also provides feedback based on the rewards collected by the users.

**Key words:**

Adaptive Gamification, Programming, Machine learning, Decision Tree, Game-based learning