# THE APPROACHES OF PERSONALIZED ADVERTISEMENTS IN TELEVISION USING MACHINE LEARNING

**Iresha Dulanjalee Anuruddha [1,*] and Suthaharan S.S. [1]**

[1] Department of Physical Science, Faculty of Applied Science, University of Vavuniya, Sri Lanka.
[*] Corresponding author email: ireshadulanji94@gmail.com

**Abstract:** In recent years, personalized television advertising that uses machine learning methods to boost interaction with viewers and the success of advertisers have received a lot of attention. In this investigation, we have investigated the use of machine learning models for targeted advertising, namely the LinearSVC, Polynomial Kernel, NuSVC, and Sigmoidal Kernel models. The purpose of this research is to examine the efficacy and viability of these models in targeting individual television viewers with relevant commercials. The feasibility of using this method to forecast consumer tastes and adapt marketing campaigns appropriately is investigated. Using higher-order polynomial transformations, the Polynomial Kernel model attempts to capture complicated connections within the data. By allowing users to adjust the parameter that determines how many support vectors are used, the NuSVC model improves upon SVM and makes it more amenable to being optimized for targeted advertising. Finally, the Sigmoid Kernel model provides a sigmoid function-based non-linear decision boundary that can adapt to a wide range of viewer preferences and send out more relevant ads. Extensive testing is performed on a dataset of audience preferences to assess the performance of these models, taking into account characteristics like demographics, watching history, and online behavior. Each model's ability to predict the reactions of viewers to commercials is evaluated using a variety of measures, precision, recall, as well as including accuracy. The trials reveal the benefits and limitations of each model, illuminating their potential in developing targeted TV commercials. The results imply that although LinearSVC provides a simple method, it may not be able to accurately capture complicated preferences from viewers. Better performance is shown by the Polynomial Kernel model since it captures non-linear interactions; nonetheless, processing complexity may be an issue. The NuSVC model's potential in improving model performance is highlighted by its capacity to regulate support vectors. The Sigmoid Kernel model performs well in accepting different tastes, giving it a good option for tailoring advertising to each individual. By investigating and contrasting the efficacy of LinearSVC, Polynomial Kernel, NuSVC, and Sigmoidal Kernel models, this research adds to our knowledge of personalized television commercials. Marketers and academics alike may benefit from these results since they can now use machine learning to create more successful and interesting personalized marketing campaigns.

**Keywords:** LinearSVC, Machine learning, Polynomial Kernel, Sigmoidal Kernel, Television Advertisements