دانشکده مهندسی برق

۳۹۶

جلسه دفاعیه از رساله دکترا

A COMPREHENSIVE FRAMEWORK FOR POLE-SLIPPING PREDICTION OF THE SYNCHRONOUS GENERATOR

چکیده

Transient stability, a crucial aspect of power system research, is the subject of this paper. It determin the system's stability under severe disturbances. In recent years, Machine/Deep Learning (ML/DL techniques have been widely applied to predict transient stability conditions. This paper presents flexible framework for using the desired number of ML algorithms and combines the results of them extract the final optimal transient stability perdition (TSP). This prediction includes stability statu (stable/unstable) and remaining time until instability is labeled with related accuracy. To show th effectiveness of the proposed framework, for instance, four different ML approaches are used: Logist Regression (LR), Support Vector Machine (SVM), Decision Tree (DT), and K-nearest neighbor (KNN The introduced framework combines the output of ML methods in two stages considering the tim dependent perdition accuracy; the first stage predicts stability status by using a hard voting system, an the second one estimates the remaining time until instability with a soft voting system. The final optim outputs of the proposed approach are dynamic time-dependent curves for the prediction of stability statu and time. The prediction accuracy changes by data size and can reach to 100% and the remaining tim until instability can predict with 0.03 seconds error, averagely. Supplementary studies examine ho noise, missing data, and important inputs affect the projections. The stability dataset is collected from th DIgSILENT Power Factory and tested on the IEEE 39-bus system. Also, the proposed framework coded with PYTHON software.

دانشجو: **(Ali Raheem Abdalredha**

استاد راهنما: **Dr. Abolfazl Vahedi**

استاد مشاور: **Dr. Alireza Sobbouhi**

اعضاء هیات داوری: **Dr. Mohammed Sarvi ,Dr. Mohsen Kalanter**

Dr. Firas Mohammed ,Dr. Turaj Amraee

تاریخ دفاع: **سه شنبه ۴۰۴/۶/۱۸** ساعت: **۱۵:۳۰**

محل: **سالن سمینار (خیام) دانشکده برق**