

# **Active Cloud Authentication Based on Touch Dynamics and Distributed Tensorflow**

Abstract

Dylan J. Gunn

Dept. of Computer Science, North Carolina A&T State University, USA  
[djgunn@aggies.ncat.edu](mailto:djgunn@aggies.ncat.edu)

Mobile devices are synonymous with the daily activities of our lives just as much as the cloud is associated with data. In this modern world, mobile devices have been paired with the cloud environment to scale the voluminous amount of generated data. The implementation comes at the cost of privacy as proprietary data can be stolen in transit to the cloud, or a victim's phone can be seized along with all of their synced data from the cloud. The attacker can gain access to the phone through shoulder surfing, or even spoofing attacks. Our approach is to mitigate this issue by proposing an active cloud authentication framework using behavioral biometrics. Given the amount of data captured by the mobile device from user activity, it can be a computationally intensive process for the mobile device to handle with such limited resources. To solve this, we offload the authentication process to the cloud. We use Random Forest (RF), the Support Vector Machine (SVM), and the Long Short-Term Memory-Recurrent Neural Network (LSTM-RNN) as our classifiers. In doing so, we will use the distributed tensorflow framework to partition the large dataset, perform calculations in parallel, converge the results, make the predictions, and display the results.