



COLLEGE of ENGINEERING AND PHYSICAL SCIENCES

SCHOOL OF COMPUTER SCIENCE

MSc Defence

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*Confession Networks: Boosting Accuracy and
Improving Confidence in Classification*

Chair: Dr. Joe Sawada

Advisor: Dr. Neil Bruce

Advisory: Dr. Rozita Dara

Non-Advisory: Dr. Mark Wineberg

Abstract:

In this paper, we propose a novel method for measuring the confidence of neural networks in classification problems. There are existing statistical approaches to measure neural network confidence for classification. However, in this paper, we propose a new loss function such that the neural network signals the amount of confidence it has for its prediction, independent of the prediction itself. The first goal of this paper is to design an appropriate loss function to output a confidence measure along with classification scores for neural networks. A second goal is to examine whether such a loss function can improve network performance.

There are many applications where a confidence measure is essential, including autonomous driving to ensure that the predictions relating to the area around the vehicle are correct or in important medical diagnostic decisions. We demonstrate that the proposed approach both improves prediction accuracy and also provides a valuable output for gauging the confidence of the prediction.