HANOI UNIVERSITY OF SCIENCE AND
TECHNOLOGY

SCHOOL OF INFORMATION AND COMMUNICATIONS
TECHNOLOGY

Improve Predictive Model Calibration for Safety-Critical Domains

Author: Le Van Tuan Anh
Student ID: 202416657
Supervisor: Dam Quang Tuan

Date of Submission: December 1, 2025

Abstract

Deep learning is becoming more and more relevant in modern day tasks like regression or classification. But deep neural networks tend to be poorly calibrated, meaning they are either over-confident or under-confident on their predictions despite being trained on a large scale of data. This makes deep learning models not-applicable in domains that require extreme safety like healthcare or medical. In this project of ours, we propose Bayesian Neural Networks, a framework that have shown an outstanding calibration compare to its MLP counterpart while having a comparable accuracy.