Bayesian Neural Networks for K-Shot Learning

Jakub Świątkowski, Matthias Bauer, Mateo Rojas-Carulla, Richard E. Turner
Department of Engineering, University of Cambridge, Cambridge, UK

In a new approach we train CNNs on lots of subsets of the training classes with shared parameters up to final hidden layer.

1. Train CNN on a subset of all classes (training classes).
2. Fix CNN weights up to the last hidden layer.
3. Train softmax weights for the rest of the classes (test classes).

Phase 1 learns a mapping to feature space and last layer weights for old classes.
Phase 2 learns a prior for the weights based on the weights from the old classes.
Phase 3 learns weights for the new classes based on the prior and K examples.
Phase 4 infers classes for test examples from the new classes.

References