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(57) Abstract :
The system in the present invention keeps the private data locally in smartphones, shares trained parameters and builds a global consensus model. The feasibility and usability of the proposed system are evaluated by three experiments and related discussion. The experimental results show that the distributed deep learning system can reconstruct the behavior of centralized training. We also measure the cumulative network traffic in different scenarios and show that the partial parameter sharing strategy does not only preserve the performance of the trained model but also can reduce network traffic. User data privacy is protected on two levels. First, local private training data do not need to be shared with other people and the user has full control of their personal training data all the time. Second, only a small fraction of trained gradients of the local model are selected for sharing, which further reduces the risk of information leaking.

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