YUTING HE

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RESEARCH INTERESTS

Machine Learning, Federated Learning, Knowledge Distillation, Incremental Learning

EDUCATION

- M.S. Computer Applied Technology   Advisor: Yiqiang Chen   GPA 3.87 / 4.0

  Institute of Computing Technology, Chinese Academy of Sciences   Sep. 2020 - Present

- B.S. Information Security   GPA 3.71 / 4.0

  Chongqing University   Sep. 2016 - Jun. 2020

RESEARCH EXPERIENCE

Learning Critically: Selective Self Distillation in Federated Learning on Non-IID Data

Institute of Computing Technology, Chinese Academy of Sciences   Nov. 2021 – Apr. 2022

- Imposed adaptive constraints on the local updates by selectively self-distilling the global model's knowledge based on the credibility estimated at both the class and sample level;
- Decoupled the distillation on each class channel by introducing an adaptive L2 loss for the logits;
- Mathematically analyzed the convergence of the method.

Class-Wise Adaptive Self Distillation for Heterogeneous Federated Learning

Institute of Computing Technology, Chinese Academy of Sciences   Sep. 2021 – Nov. 2021

- Assessed the global model's inference confidence of different categories using an auxiliary dataset as the class-wise weight to dynamically adjust the impact of the distillation.

PROJECTS

Fed-nnU-Net: Federated Learning for Vessel Segmentation of Head and Neck Angiograms using nnU-Net

Institute of Computing Technology, Chinese Academy of Sciences   Jun. 2022 – Aug. 2022

- Construct a federated learning system based on nnU-net for 3D computed tomography angiography (CTA) vessel segmentation task, and the experiments on real data collected from two hospitals demonstrate the effectiveness.

Development and Testing of Federated Computing Model Based on Cambrian MLU290

Institute of Computing Technology, Chinese Academy of Sciences   Mar. 2021 – Sep. 2021

- Designed a federated computing framework based on Cambrian MLU290, including Logistic Regression, Random Forest, Gradient Boosting Decision Tree and Neural Network.

Anomaly Detection with Memory-Enhanced Composite Neural Networks for Industrial Control Systems

Institute of Computing Technology, Chinese Academy of Sciences   Jun. 2019 – Dec. 2019

- Assist with designed an effective framework for multivariate unsupervised time series anomaly detection, and the experiments on two industrial control systems cybersecurity datasets (SWaT, WADI) demonstrate the effectiveness.

HONORS & AWARDS

- National Scholarship (granted with 20K RMB, 2022)
- AAAI 2022 Student Scholarship (granted with $250, 2022)
- E Fund Fintech Scholarship in Institute of Computing Technology (granted with 10K RMB, 2021)
- Merit Student in University of Chinese Academy of Sciences (2021, 2022)
- Third place in CCF BDCI Contest on Automatic Identification of Butterflies in The Wild Task (2020)
- Outstanding Undergraduates of Chongqing University (2020)
- National Encouragement Scholarship (granted with 5K RMB, 2017)

PUBLICATIONS

1. **Yuting He**, Yiqiang Chen, XiaoDong Yang, Hanchao Yu, Yi-Hua Huang and Yang Gu. "Learning Critically: Selective Self-Distillation in Federated Learning on Non-IID Data". IEEE Transactions on Big Data (TBD), 2022

2. **Yuting He**, Yiqiang Chen, Xiaodong Yang, Yingwei Zhang and Bixiao Zeng. "Class-Wise Adaptive Self Distillation for Federated Learning on Non-IID Data (Student Abstract)". AAAI Student Abstract and Poster Program, 2022