

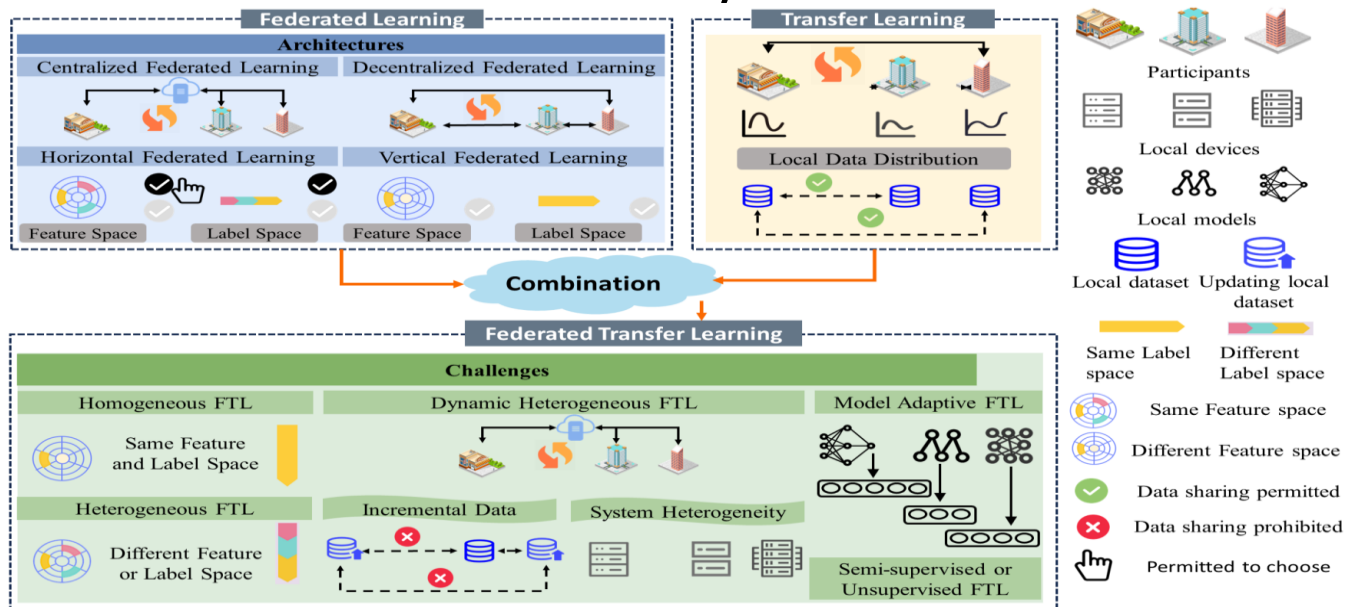
A Comprehensive Survey of Federated Transfer Learning: Challenges, Methods and Applications

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Motivation & Ideas

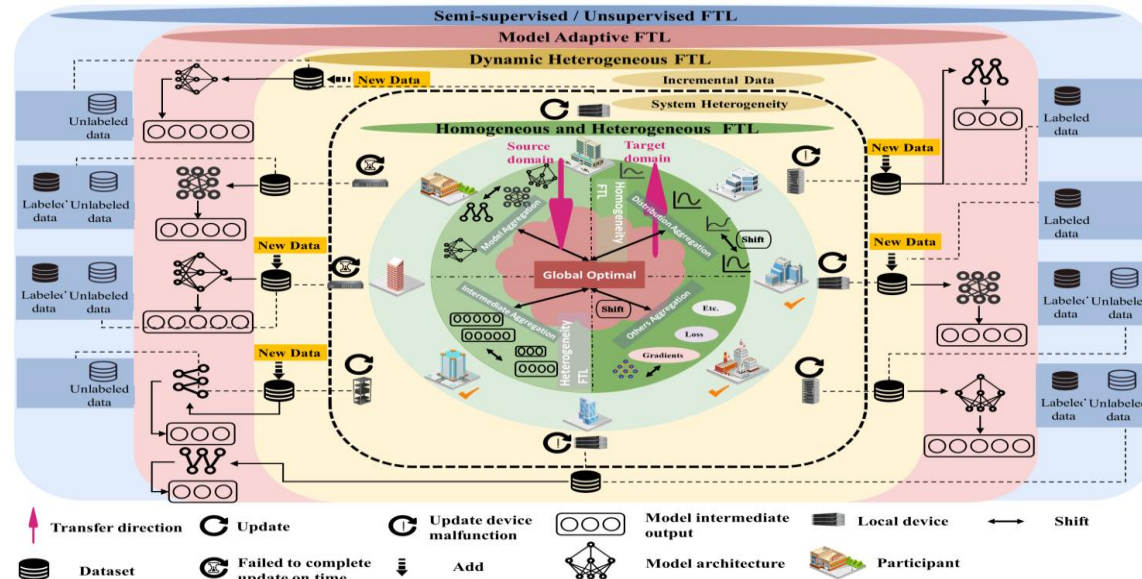
- Motivation: This survey comprehensively reviews federated transfer learning (FTL), which integrates transfer learning techniques into FL.
- Ideas: We categorize and review the current progress on federated transfer learning (FTL), outlining its solutions, applications, common scenarios, available datasets, and significant research in this survey.



The overview of FTL. In a typical FTL setting, participants collaborate to train a shared global model while keeping their data locally. However, the data distributions, feature spaces, and label spaces may differ among participants, leading to non-IID data. Additionally, participants may also have varying computational capabilities and data availability.

Main Contributions

- Contributions:
 - We provide the definitions of FTL and its challenges including homogeneous FTL, heterogeneous FTL, dynamic heterogeneous FTL, model adaptive FTL, semi-supervised FTL, and unsupervised FTL.
 - We further detail these challenges of FTL through examples and give the current research status for FTL challenges.
 - We summarize the scenario settings of the homogeneous FTL which are the most common situations in FTL.



Constrained by the unique distributed learning paradigm of FL, current FTL studies face many additional challenging situations, including homogeneous FTL, heterogeneous FTL, dynamic heterogeneity FTL, model adaptive FTL, semi-supervised FTL and unsupervised FTL.