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sPLINK: a hybrid federated tool as a robust alternative to meta-analysis in genome-wide association studies

Meta-analysis has been established as an effective approach to combining summary statistics of several genome-wide association studies (GWAS). However, the accuracy of meta-analysis can be attenuated in the presence of cross-study heterogeneity. We present sPLINK, a hybrid federated and user-friendly tool, which performs privacy-aware GWAS on distributed datasets while preserving the accuracy of the results. sPLINK is robust against heterogeneous distributions of data across cohorts while meta-analysis considerably loses accuracy in such scenarios. sPLINK achieves practical runtime and acceptable network usage for chi-square and linear/logistic regression tests. sPLINK is available at https://featurecloud.ai/app/splink .

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