Client Selection Algorithms

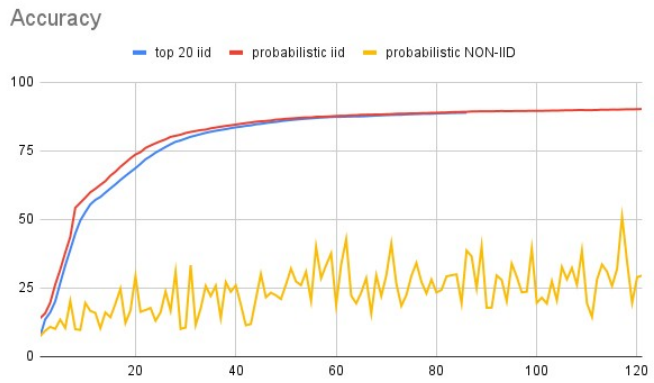
Idea: Choose which clients participate in a given global round based on an average of their previous turnaround time.

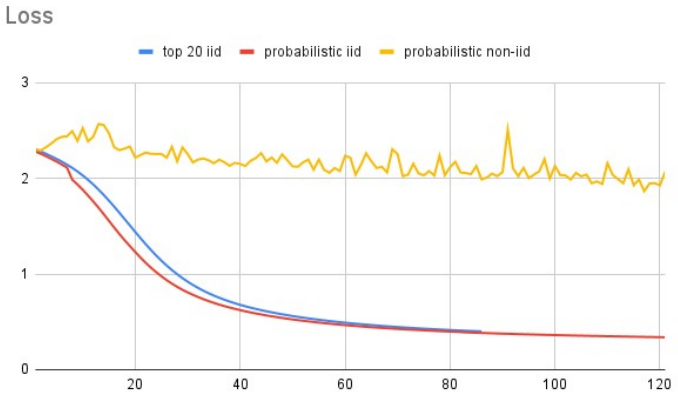
Methodology: Clients' past response time is measured and stored in a DynamoDB table; exponential weighted averaging is applied.

Algorithms:

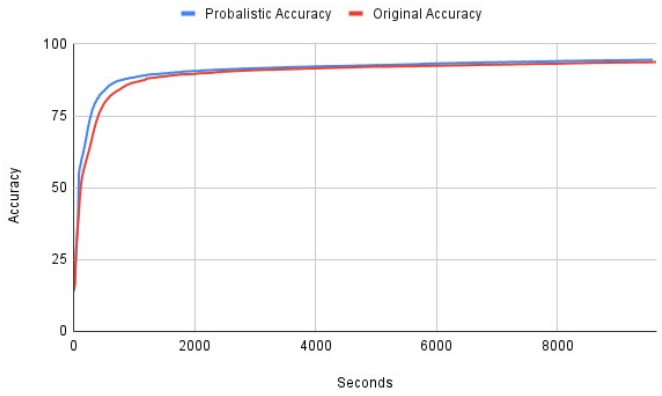
- Top 20 algorithm: top 20 fastest clients are selected

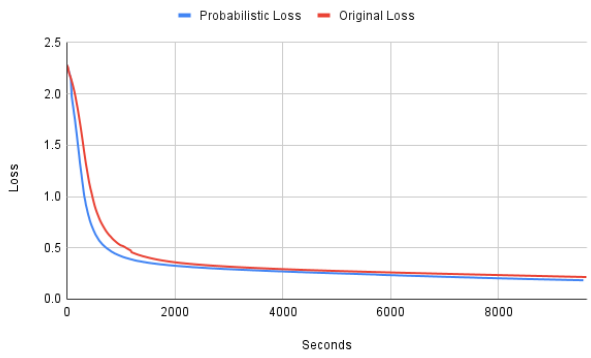
- Probabilistic algorithm: client turnaround times are normalized to be between 0 and 1, which becomes their probability of being chosen.





When compared to the original method of merely choosing all 40 clients available, the time it took to complete a full global round dropped from 20 seconds to ~13.5 seconds with the probabilistic client selection algorithm. This lead to the model achieving higher accuracy in a shorter amount of time.





Regions of the top 12 fastest clients by the last round:

Top 20, IID data	**Probabilistic, IID data**	**Probabilistic, Non-IID data**
Ohio	California	Virginia
Ohio	Ohio	Virginia
California	Ohio	Ohio
London	Ohio	Ohio
London	London	Ohio
Virginia	California	London

Virginia	California	Ohio
London	California	Ohio
Virginia	Virginia	Virginia
Virginia	Virginia	London
Virginia	Virginia	Ohio
London	Virginia	Ohio