Distributed Machine Learning Algorithms on OPAL

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Human Dynamics
How can we build machine learning models on OPAL?
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- We would like to build models using OPAL architecture.
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- We would like to build models using OPAL architecture.
- These models should keep OPAL promises.
OPen ALgorithms (OPAL)
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- Data providers.
OPen ALgorithms (OPAL)

- Data providers.
- Vetted algorithms.
OPen ALggorithms (OPAL)

- Data providers.
- Vetted algorithms.
- Queriers.
  - Blockchain for monitoring
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OPAL features
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- Aggregated answer from data providers.
OPAL features

- Aggregated answer from data providers.
- Protects raw data.
OPAL features

- Aggregated answer from data providers.
- Protects raw data.
- Records all transactions on a Blockchain.
Limitations of the current OPAL
Limitations of the current OPAL

- Unable to generate machine learning models.
Limitations of the current OPAL

- Unable to generate machine learning models.
- Limited useful answers due to the first point.
Federated learning
Federated learning
Federated learning

Aggregated language model (Generalized model)

Hyperparameters

Hyperparameters
Decentralized Federated learning
Decentralized Federated learning

- Any OPAL server can build generalized models by aggregating hyperparameters from data providers.
Decentralized Federated learning

- Any OPAL server can build generalized models by aggregating hyperparameters from data providers.
- These models then can be shared with the client to run predictions.
New architecture
New architecture

- Add vetted machine learning algorithms
New architecture

- Add vetted machine learning algorithms
- Add collections of vetted ML models.
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- Allow OPAL to generate an answer using multiple ML models using aggregated hyperparameters.
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Questions?