Software Requirements Specification (Draft)

Revision History:

Date	Author	Description
March 17	Fang Hanbin	Add use cases

Use Cases

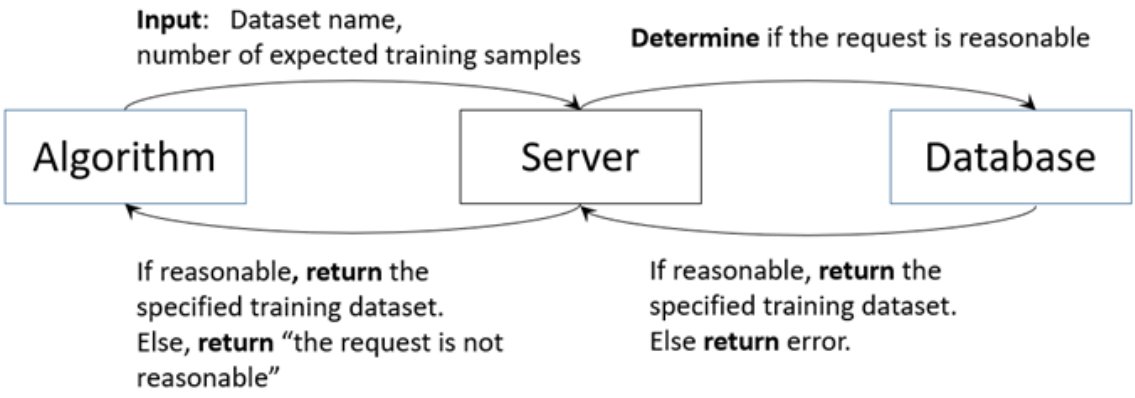
Case: Get the training data
Case: train model
Case: Save the trained model
Case: personalized fine-tuned model checkpoints

Case: Algorithm Output prediction results

Case: Save the performance metrics of the Algorithm model

Case : Get the training data

- version: 1
- Created: March 19
- Authors: Fang Hanbin
- Source: Algorithm
- Actors: Algorithm
- Goal: get training data
- Summary: Algorithm developers need to get the training data to train the model before the system starts working. We will use this data to train the model to get the model data
- Trigger: Input the number of expected training data samples and the name of dataset
- Frequency: Irregular or only once?
- Precondition: Have built the framework and designed the dataloader. Data formats are agreed upon.
- Postconditions: No



Basic Flow

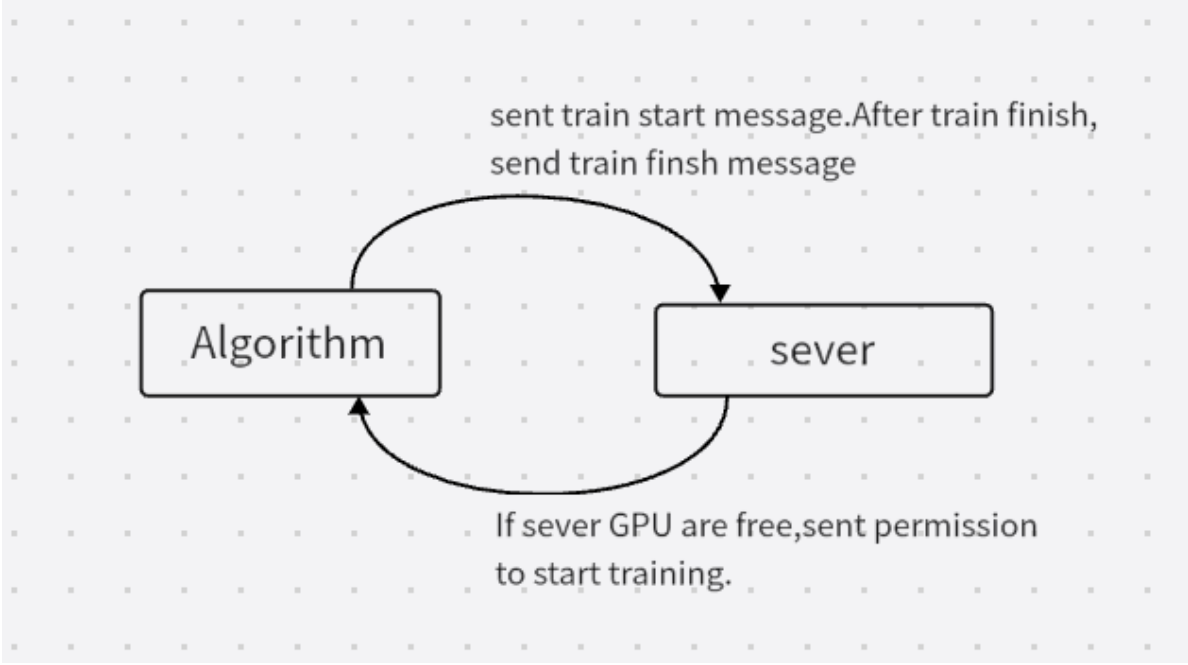
Actor	System
Send Algorithm-input request <Dataset name，the number of record in this Dataset>	
	Receive the number and the dataset name
	Determine if dataset is exist and this demand number in specified dataset is reasonable.
	Fetch dataset from the database
	Return the specified dataset or warning
Algorithm-receive < expected training dataset>	

Alternative Flow

Actor	System

Case: train model

- version: 1
- Created: March 19
- Authors: Fang Hanbin
- Source: Algorithm
- Actors: Algorithm
- Goal: get a trained model
- Summary: After get the train data,algorithm developer need to catch the possible data anomalies and clean the data and final train the model. Because training takes a lot of computing resources. Maybe we need to seed a signal to tell other part the server's GPU is busy.
- Trigger: the train data is sent to.
- Frequency: Irregular or only once?
- Precondition: get the train data.
- Postconditions: No



Basic Flow

Actor	System
Check the input data	
Send train start message	
	Receive the message and check if sever GPU is free
	wait until GPU is free,send permission.
Train the model	
send train finish message	

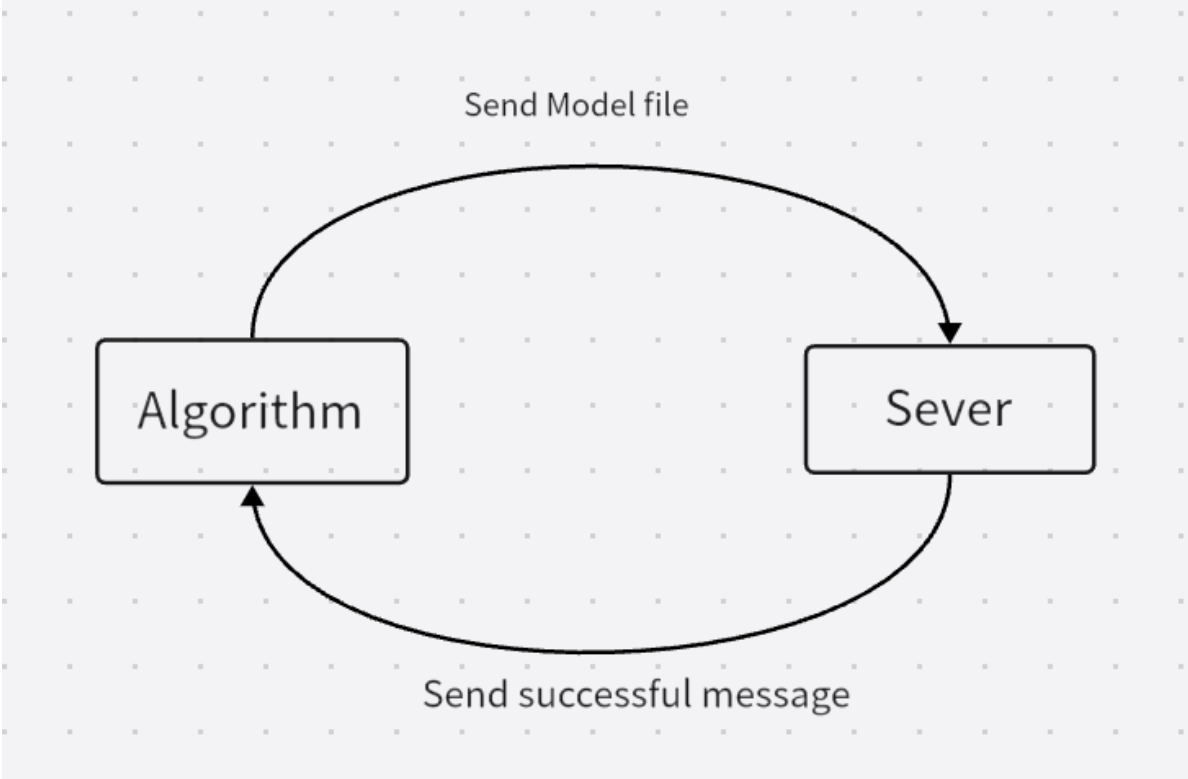
Alternative Flow

Actor	System
Find the input data error,repeat request the input data	
	repeat to send data to train model

Case: Save the trained model

- Version: 1
- Created: March 19
- Authors: Fang Hanbin
- Source: Server
- Actors: Algorithm

- Goal: Save the trained model
- Summary: When algorithm developers have trained the model successfully, they will save the model in sever.
- Trigger: Input the pretrained model checkpoints
- Frequency: Irregular or only once?
- Precondition: Algorithm developers have trained the model successfully
- Postconditions: No



Basic Flow

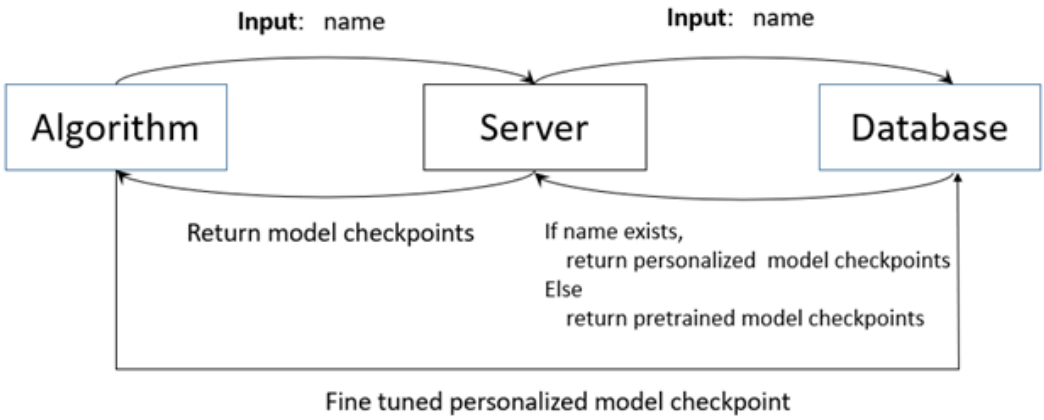
Actor	System
Algorithm send train finish message	
	Recevie the model file
	Save the model in sever。
	Return success
Algorithm receive success message	

Alternative Flow

Actor	System

Case: personalized fine-tuned model checkpoints

- Version: 1
- Created: March 19
- Authors: Fang Hanbin
- Source: Server
- Actors: Algorithm
- Goal: personalized fine-tuned model checkpoints
- Summary: Based on pretrained model and personalized features, fine tune the model and save the personalized model checkpoint into the database
- Trigger: Input name
- Frequency: 1 day
- Precondition: Postconditions: No



Basic Flow

Actor	System
Algorithm input person name	
	Algorithm input person name
	Check that if name exists
	Return model checkpoint and personalized data
Algorithm receive the model parametrs and personalized data	
Algorithm input fine-tuned personalized model checkpoint	
	Receive the personalized model checkpoints
	Save the checkpoint into the database
	Return success
Algorithm receive the personalized-model-successfully-save	

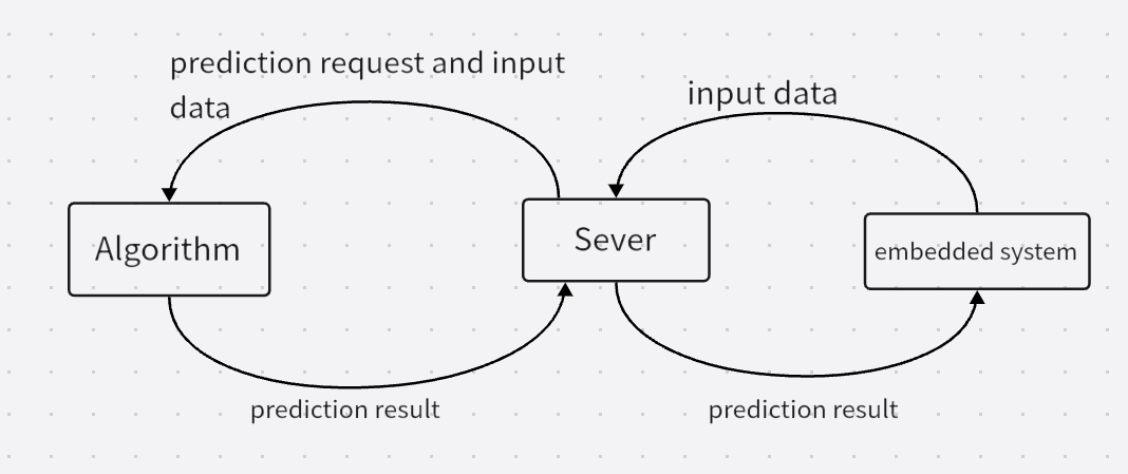
Alternative Flow

Actor	System

// We need to deploy the model to an embedded device，maybe?

Case: Algorithm Output prediction results

- Version: 1
- Created: March 20
- Authors: Fang Hanbin
- Source: Server
- Actors: Algorithm
- Goal: Algorithm Output prediction results
- Summary: After the input crossing the model, Algorithm will output the prediction results
- Trigger: Algorithm output the results
- Frequency: To be determined
- Precondition: When Algorithm received the prediction request.
- Postconditions: When Algorithm has finished making predictions



Basic Flow

Actor	System
Algorithm input prediction results	Sever send the prediction request and input data
receive the input data and sent it cross the model	
Algorithm send prediction result	
	Receive the prediction result
	Return prediction to the embedded system

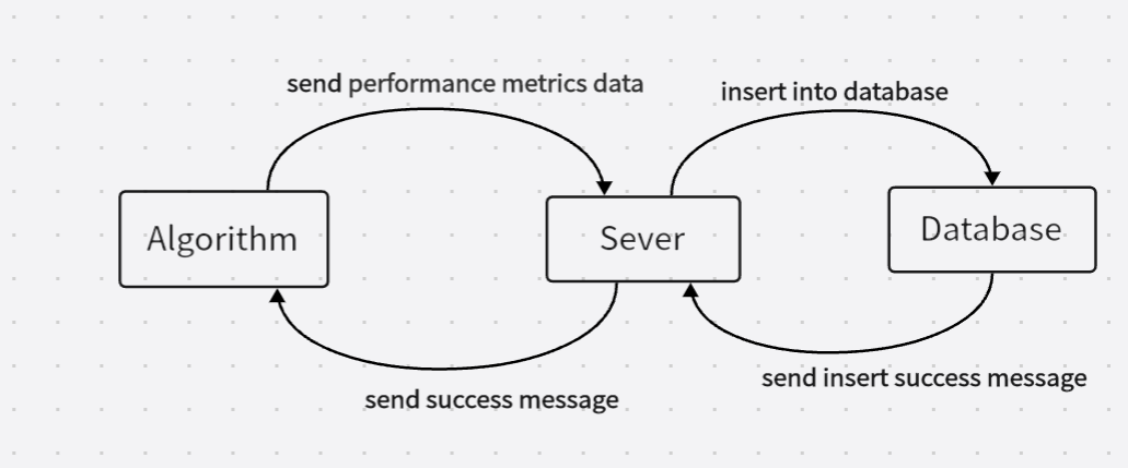
Alternative Flow

Actor	System

Case: Save the performance metrics of the Algorithm model

- Version: 1
- Created: Mar. 20
- Authors: Fang Hanbin
- Source: Server
- Actors: Algorithm
- Goal: The algorithm wants to store the performance metrics of the Algorithm model in database
- Summary:
- Trigger:
- Frequency: Irregular
- Precondition: Algorithm has trained their model and run the sensor data in their model

- Postconditions: The database has stored the performance metrics of the Algorithm model



Basic Flow

Actor	System
Algorithm send performance metrics data	
	Sever received it
	Sever send it to database
	Database stores it
	Database send success message
	Sever send success message to Algorithm

Alternative Flow

Actor	System