Ji Liu

709327148@qq.com · (+86) 150-0019-3830 · GreyPlane ·

About

I'm a self-learned programmer who has a bachelor's degree in Communications, working across almost the whole lifecycle of modern Web application development(frontend, backend, bigdata, devops), but especially focusing on Functional Programming and Stream Processing. And with some academic interest in Programming Language Theory and Distributed Systems, read some papers, and do a little bit of research as a hobby.

Work Experience

Convertlab Inc. 06/2020 – 03/2021

(React Front-end Engineer) Application Team

- application development based on React and Redux, with UI component library Ant Design, using Typescript.
- integrate Typescript toolchain into the existing webpack build pipeline, enable our team to migrate to Typescript gradually.
- develop UI components library based on ant-design.
- develop a low-code form design application which allows user to use simple drag and drop method creating complex form with relation between questions that can be later rendered on mobile devices.

Convertlab Inc. 04/2021 – 08/2023

(Software Engineer) Data Team

- often in charge of design, implementation whole project or module no matter which part of technology it uses or area it belongs, and report to high level managers directly.
- maintaining our flagship product's most prominent module Reactflow, a Flink-like streaming processing middleware which built on Actix and Kafka, and using MongoDB as persistence layer.
- regular API development for other microservices based on Tokio, Serde and using MySQL as persistence layer.
- integrate Reactflow with third-party partner like Tencent's data intelligence department YouShu.
- some data processing / ETL work related with Spark(Scala), Impala, Kudu.

Projects

Reactflow

a low-latency, high-throughput streaming processing system, represent the whole journey of a customer in a campaign which is the implementation of our clients' marketing strategy(when customer did what and then we should do what if he meets some criteria), aslo coordinate other functionalities of application to meet the goal.

- the selling point of our main product - digital marketing cloud DMHub.
- able to support thousands of instances and thousand million of customers running simultaneously and stably.
- enhencing existing product with the ability to choose multiple criteria for customer to enter the flow and set arbitrary number for the maxium reentrance times for one customer at a flow.
- implement an algorithm to validate topology definition of a flow such like if it has cycle or other our own bussiness logic requirements with slighty modified topo sort.

Knowledge Graph

accroding COO's schedule, create a platform for saving and editing our knowledge into datebases, which can be retrieved by certain pattern, in such we can build company's knowledge system that reducing the efficiency lost between knowledge transfering therefore increase productivity.

- research the whole concept of so called knowledge graph and how to use it to represent our goal practically.
- represent every concepts as ontology(works like category of things) and entity that belongs to and constraints by certain ontology, and modelling it by two separate lablled property graph which store in Neo4J.
- implement a graph visualization front-end application that support showing, seaching, modifying entity graph by React, Typescript and AntV.
- implement the backend service based on Neo4J which utilize Neo4J's ablitiy to import ontology definition from Protégé, and use mostly only Cypher query language to implement CURD functionality of entity graph, featuring complex graph joining because every modification on entity graph must be validated by checking ontology graph, also implement basic search logic such like shortest path between two entities accroding to a certain type connection.

Message Engine

a middleware that unifies the approach of sending through sms or other channel that can reach out end users, made the message sending process to be robust and reliable, and the integration of thrid-party service provider much easier, also automatically get the commmon features like batching request or delay the sending if it was triggered at a time that will disturb customers.

- design the high-level archtecture, divide whole project into server side and sdk library for client usage, and utlize Kafka Streams to implement stateful functionality and guarantee the effective exactly once delivery semantic.
- implement the batching logic using Kafka Streams, optimize the performence by designing our own data schema that working directly on bytes instead of ser/der JSON everytimes when saving or retrieving message from kafka state store.
- implement the disturbing time check and delay functionality, using HBase as storage.
- research how to reduce the duplication caused by Kafka rebalance with low cost, implement it into our own kafka consumer wrapper that used by sdk.

Data Permission

working directly with CTO, reimplement our way to apply permission control to data accessing, make it more like a standard ABAC system.

- implement a SQL AST tranformation pass which compile original SQL into permission applied SQL, which include more clauses for checking if data was accessible for current user or department, or if data was sharing to the current user manually.
- implement several Spark jobs for computing sharing data based user customized rule.

Personal Projects

AlgebraicGraph https://github.com/GreyPlane/algebraic-graph

algebraic graph implementation in Scala

- read, implement both associated type families and plain algebraic data types encoding and bunch graph opearations describe in paper using Scala.
- Using encoding describes in this paper to build a library for constructing the topology of our Flink-like component programmatically, is an elegant solution because the good algebraic properties holds by the encoding, implement both TypeFamilies-based and ADT-based encoding in Scala.

A=B https://github.com/GreyPlane/AeqB

interpreter for esolang A=B in Haskell

- Using Free Monad and implements via the approach that described in paper data type a la carte.

Skills

- **Program Language**: multilingual (not limited to any specific language), comfortable with Haskell Rust Scala Typescript (in random order).
- **Web Frontend (React)**:
  - Experienced in React and Hooks API.
  - Experienced in Typescript
  - Experienced in the ecosystem around React, includes but is not limited to routing, state management, query library, can delivery project independently.
- **Web Backend**:
  - experienced in morden web application development that using Actor system, HTTP server/client technologies, CRUD on RDBMS or NoSQL, document API using Swagger and other general concepts.
  - understand Microservices architecture and containerization technology such like Kubenates and Docker, can delivery project independently.
- **BigData**:
  - have solid understanding of basic topics about the distributed system such as consensus algorithm, delivery semantic.
  - have Deep knowledge of Kafka and general streaming processing framework, have experience of developing real-time data processing pipeline.
  - use components in Hadoop ecosystem like HBase, HDFS, also Impala, Kudu.
  - write spark job to process data, in both RDD API and Spark SQL, have solid understanding of how spark works on the high-level.
  - certificated Cloudera Hadoop System Administrator.
- **Functional Programming**:
  - Capable to adapt functional programming technique in the real world project.
  - Able to solve the complicated problem that involves advanced topic about type theory or category theory.
- **Evangelist**:
  - teaching Typescript for colleagues, helping them to solve problems associated with types.
- **CS Basic**: learned CSAPP and SICP, has solid CS foundation, also learned some PL theory.
- **Development Tool**: Can adapt to any editors/OSs, usually use Vscode, IntelliJ, Emacs under MacOS.

Education

College of Publication, **Shanghai Publishing and Printing College** 08/2015 – 06/2018

Bachelor of Communications, **University of Shanghai for Science and Technology** 08/2018 – 06/2020

Miscellaneous

- Languages: English - fluent
- **3 kyu** on CodeWars, primarily in Haskell, Agda and Idris