

# An unexpected R Shiny journey: Time series forecasting modelling from SQL to R

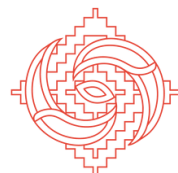
**Jing Liao**

Health Insights & Analytics Team

May 2024



**Whānau**



**Rangatira**



**Kaitiaki**



**Wairua**

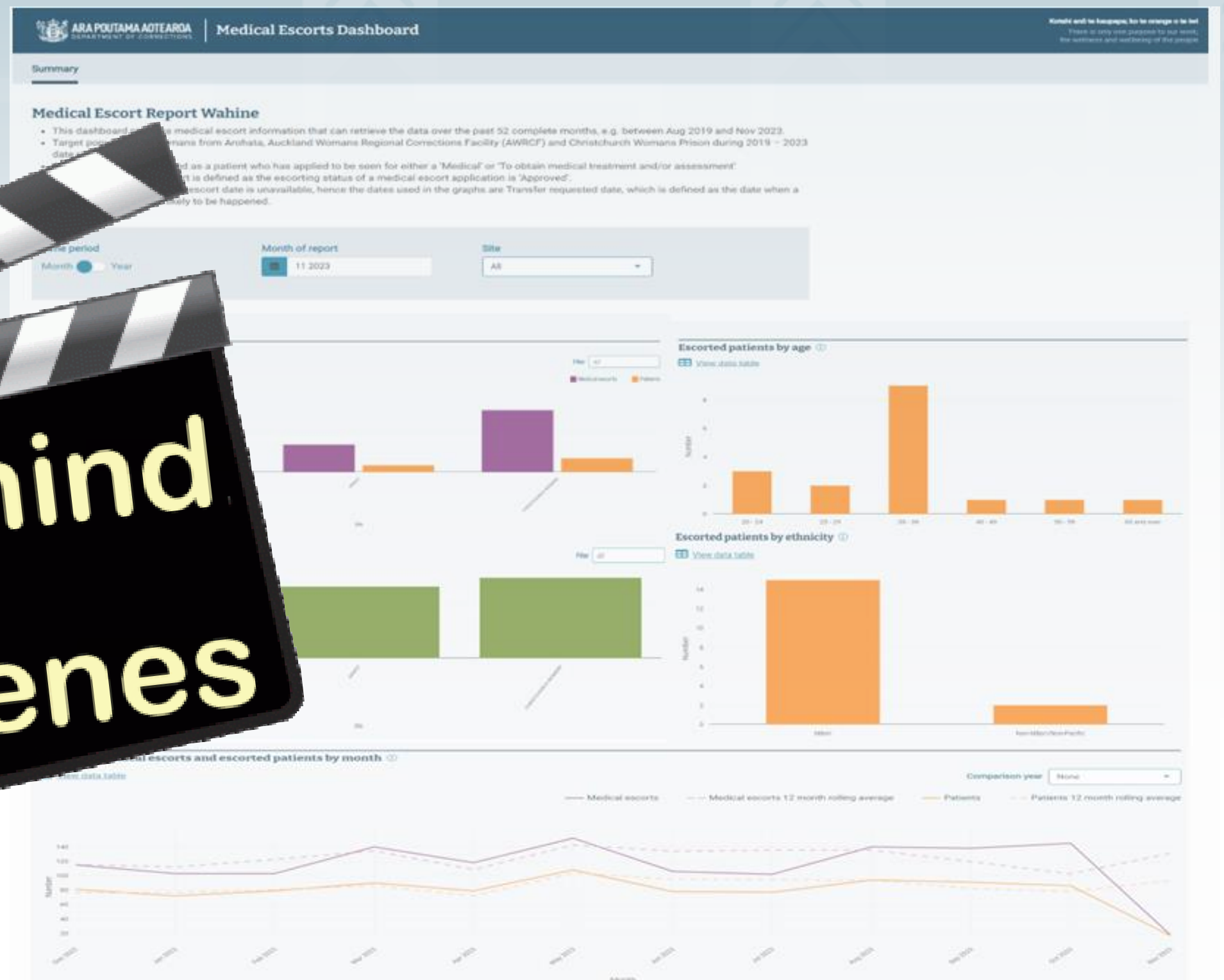


**Manaaki**

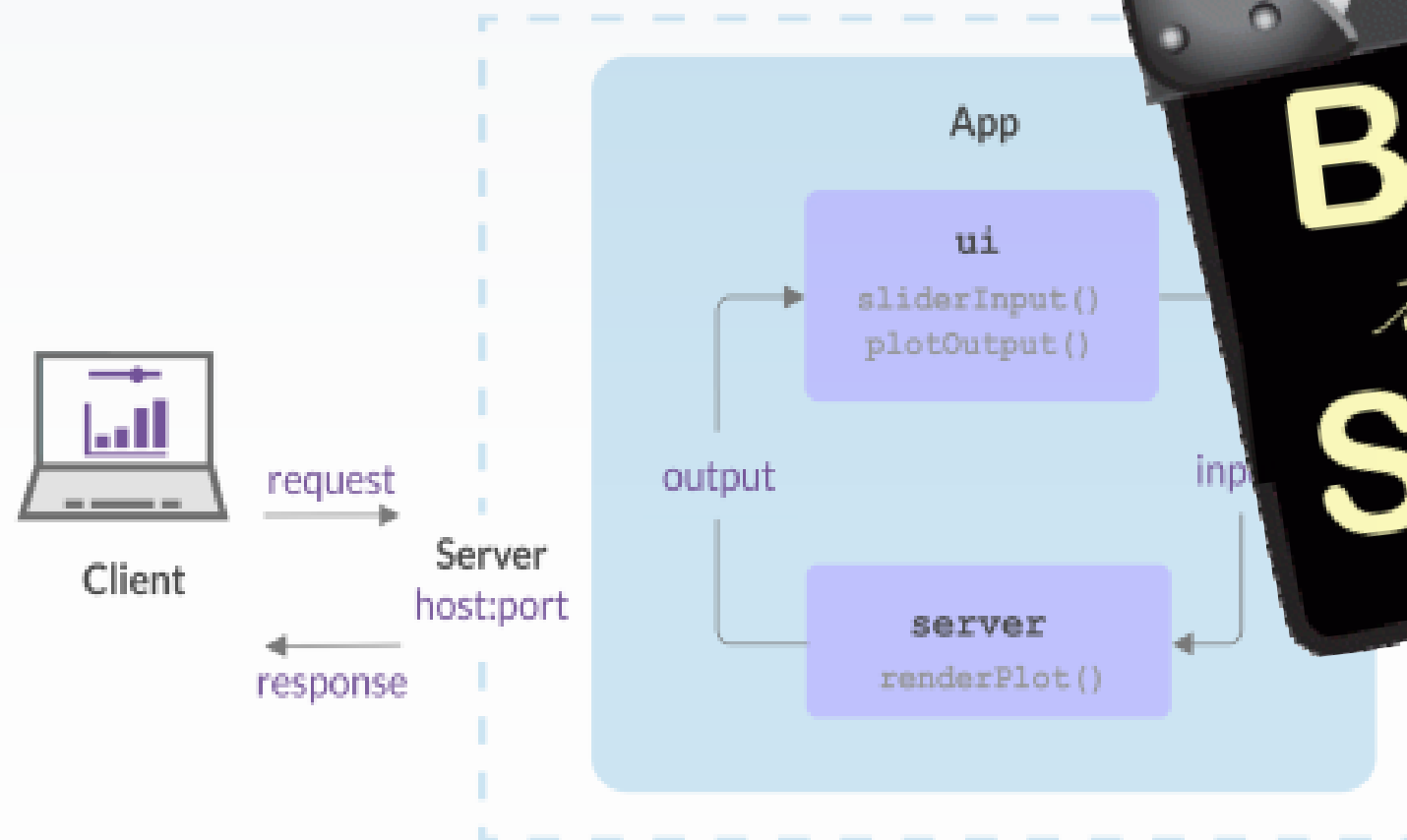


**ARA POUTAMA AOTEAROA**  
DEPARTMENT OF CORRECTIONS

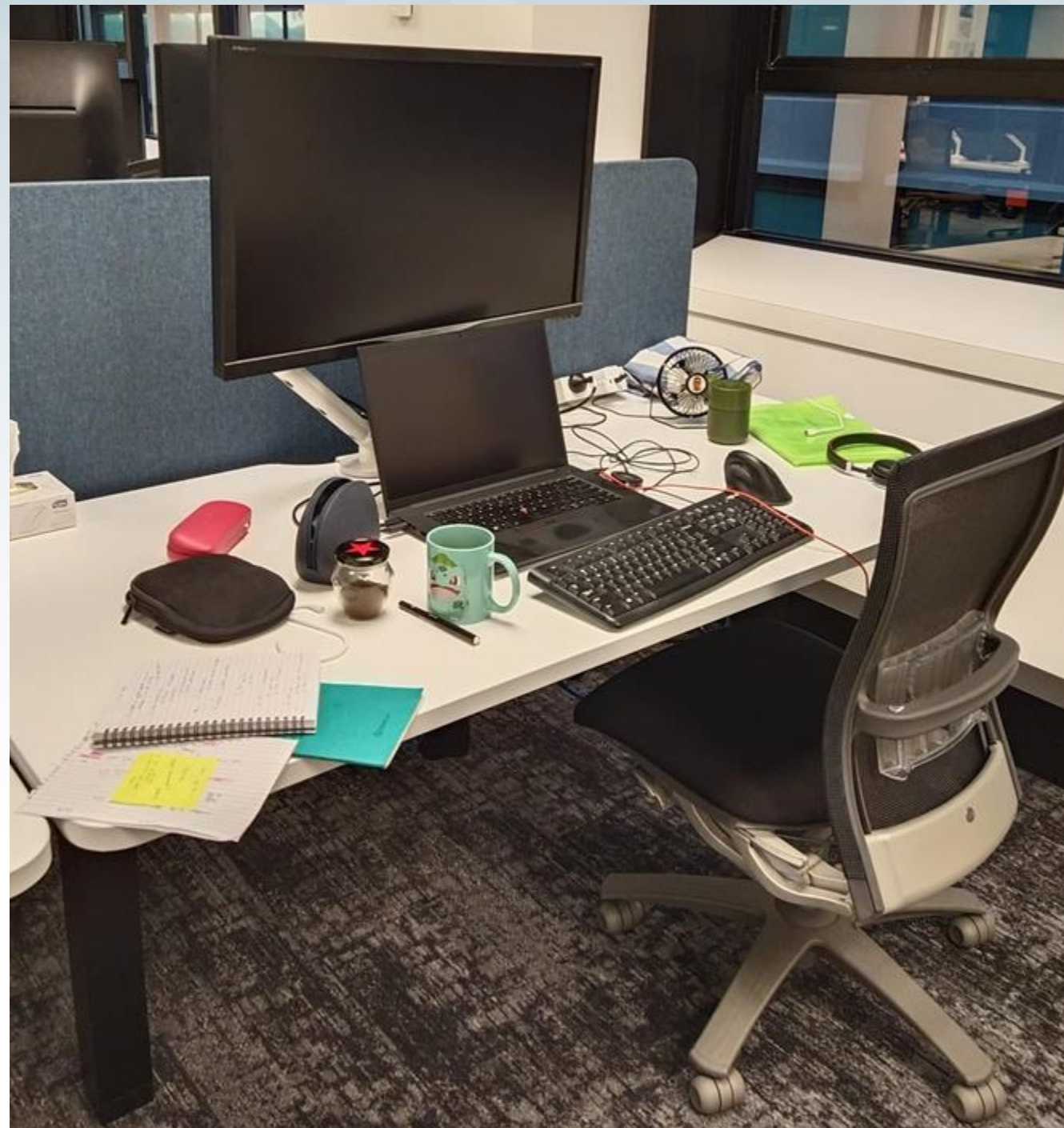
# An R Shiny Journey



Behind  
*the*  
Scenes



# The journey is unexpected, because ...



- Every R user is unique
- Every project is different



# Structuring R/R Shiny projects

## Team-wise Perspective

### Concepts

- Adaptable
- Flexible
- Interpretable

### SOP

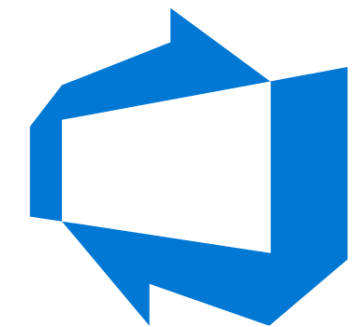
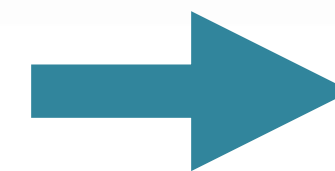
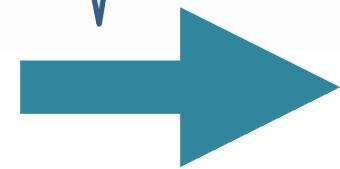
- Folder and file management
- Project documentation
- Coding standards
- Version control

# General Technical Environment

DBI and odbc  
R packages  
e.g.: dbConnect  
dbGetQuery

Git repository and  
version control

Oracle SQL Developer



Azure DevOps

# Project Structure

## Example: TS Forecasting Shiny App

R Shiny App Folder Package

Project Folders

```
TS_project
├── .git
├── .gitignore
├── .Rhistory
├── .Rproj.user
├── app_root
│   ├── app_data
│   ├── global.R
│   ├── README.md
│   ├── rsconnect
│   ├── server.R
│   ├── source
│   │   ├── dbConnection.R
│   │   ├── pages
│   │   └── util
│   ├── ui.R
│   └── www
│       ├── bootstrap
│       ├── css
│       ├── fonts
│       ├── img
│       └── js
├── app-TS_project.Rproj
├── lib
├── README.md
├── res
└── src
```

Introducing:

- Common coding blocks
- Functional programming

# Ideas behind Building Projects

## Oracle Common Coding Logic

- Strengthen data fundamentals
- Polish SQL coding skills
- Standardise code for frequent queries

## Functional Programming Paradigm

- Reduce the amount of code
- Reproduce reliable results/reports
- Increase referential transparency



## References

- Building reproducible analytical pipelines with R, Bruno Rodrigues (2023)

<https://raps-with-r.dev>

# Organising Projects

## Script Templates

```
#####
#
# Name: <Program name>
# Author:  <First name> <Last name>
# Date created: YYYYMMDD
#
#####
# Context:
#   <Short description of the project>
#
#####

# [1.0] Set up directory parameters

# [2.0] Source relevant programs

# [3.0] Import data

# [4.0] Apply data cleaning/wrangling

# [5.0] Perform feature engineering

# [6.0] Train your model

# [7.0] Model evaluation & selection

# [8.0] Results representation

# [9.0] Interpretation and communication

#####
# END OF PROGRAM
#####
```

```
/******
Program name: <Program name>
Author (first modified): <Your name>
Date (first created): <YYYYMMDD>
*****
Context:

    <Useful info about including relevant locations on git if applicable>|
*****
Substitution variable(s) include:
{
    &&IR_ref_num = <IRYYYYNNNN> -- Project ref number for your mahi
    &&user_id = <your username>
    <... etc.>
}
*****
PRIMARY DATA OBJECT(S) INCLUDE:

<object_name_1>: table description

<... etc>
*****

-- [0.0] Reset substitution variables
UNDEFINE IR_ref_num user_id;

-- [1.0] Identify base population data
-- [2.0]
-- [3.0]
-- [4.0]

/******
-- END OF PROGRAM
*****
```



# Organising Projects

## Tips

- Folder structure
- Coding standards
- Code documentation and comments
- Naming convention
- Version control and backup

### References

- Coding standards and guidelines, Geeksforgeeks (2022)

<https://www.geeksforgeeks.org/coding-standards-and-guidelines/>

- 6 coding best practices for beginner programmers, Vartanian, E. (2022)

<https://www.educative.io/blog/coding-best-practices>

# Reporting Quality

## Azure DevOps – Git & Branch

 Repos

 Files

 Commits

 Pushes

 **Branches**

 Tags

 Pull requests

 Advanced Security

forecasting work

Active

 1586 

SL

 Sih-Jing Liao proposes to merge [Forecasting](#) into [master](#) 0/15 comments resolved

Overview

 Files Updates Commits Conflicts

 Sih-Jing Liao must approve

 1 merge conflict

 2\_clean\_data.R

Description

version 0.1 completed

Approve

Set auto-complete

SL

GA

FY

Reviewers

Add

Required

☐

SL

 Sih-Jing Liao  
No review yet

Optional

☐

FY

 FUJITA, Yuki (WELLHO)  
No review yet

☐

GA

 Ghazaleh Aslani  
No review yet

# Back to TS Forecasting Project

## Next Step

- Assess more time series models  
e.g.: SES, (S)ARIMA, VAR, CPR models
- Simplify analytical pipelines including model validation using functional programming

# Our Data Science Nerds



**Asheel  
Ramanlal**



**Ghazaleh  
Aslani**



**Nate  
Mataira**



**Matthew  
Spencer**



**Jacob  
Byron-McKay**



**Jaeda  
Trapp**



**Yuki  
Fujita**



**Jing  
Liao**



# Thank you

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