



# Songhyeon Jun

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## Fullstack SW Engineer

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## Introduction

A strong problem solver from Fast and deep focusing with dynamic programming method.  
An enthusiastic performance improver. A patient mentor. An Addict on High performance.  
A careful proposer.  
Recently interested in the trend on frontend technology crossing over backend area.

## Work Experience

### SW Engineer Senior

COMPANY: **Dimensional Fund Advisors (DFA)**  
<https://dimensional.com/>

From: 8/2022  
currently work here

ROLE: maintain, debug, and improvement for SMA, Model Center, Fund Center, and other applications

SKILL SET: React 17,18(class, functional), jotai 1/2, Javascript(vanilla/ES6~2022), Node.js, Express.js, Jenkins, Jest, Monorepo(Rush repo), Git, Playwright, RTL(React Testing Library), PDFMake, D3

ACHIEVEMENTS :

- ★ Create Reusable SVG chart library to support and generalize the company design
- ★ Create reusable tooltip, shadow scroll container, and toast components
- ★ Convert JSDOM based chart rendering to server-side rendered svg to support PDFMake svg in Web Worker environment
- ★ Node.js express server with winston logger for ECS format
- ★ Playwright test automation in BDD style on Docker, dev server in authenticated network
- ★ Improvement and management of SMA center, Model Center, Fund Center app
- ★ Refactor large legacy class components to modularized function components
- ★ upgrade legacy project to modernized project including typescript, vite, jotai2
- ★ Upgrade testing environments including jest, RTL, Playwright, jest-preview, react profiler
- ★ Create/Improve logic for PDF generation(PDFMake)
- ★ Create new disclosure manager
- ★ Create general purpose libraries including tooltip, local atom handler, jotai libraries for general purpose

## SW Engineer Senior (Team Lead)

COMPANY: **USAA**

<https://usaa.com/>

From: 9/2018

To: 8/2022

ROLE: Maintain & Improve Financial Readiness/Wellness app, Small Business Insurance app

SKILL SET: React (class, functional), Redux, Router(v5/v6), Java8, Javascript(vanilla/ES6~2021), RESTful API(JBoss/Spring boot/Node.js & Express), Openshift, gitlab-ci, Mocha, Jest, Enzyme, Cypress, RTL(React Testing Library), Spock, Mockito, JUnit(4/5), Kafka

ACHIEVEMENTS :  
★ Improvement of Small business Insurance Experience  
★ Modernization of Financial Readiness site (Talon/New Web)  
★ Improve performance/reliability of the Financial Readiness app  
★ Involved to overall applications except for batch process  
★ Leading the dev team

## Lead SW Engineer

COMPANY: **Eonic Korea**

<http://eonic.co.kr/>

From: 7/2016

To: 3/2018

ROLE: Signal Analysis, Architecture, Development

SKILL SET: C, C++, Socket communication, Labview, Intel IPP/TBB, Linux, Lab Windows/CVI, GIT/SVN

ACHIEVEMENTS :  
★ Development of Harbor defense system  
★ Development of sonar system in a submarine(Jangbogo)  
★ Software team lead  
★ Software architecture, analyze sonar footprints

## SW Engineer

COMPANY: **Realtimewave**

<http://realtimewave.com/>

From: 2/2011

To: 6/2016

ROLE: Development of Automated/Manual Test Solutions for real time devices such as UAV and Guided Missile Systems

SKILL SET: C/C++, MFC, C#.Net, RT/Java, LUA, Python, Socket, XML, OpenGL, Python, MATLAB, VxWorks, Linux, QT

ACHIEVEMENTS :  
★ Initiate / Develop TestNgin™ - RT testing tool  
★ Participate developing RTNgin™ - RT simulator  
★ Initiate Packet management and automated scenario software  
★ Initiate Realtime scenario management software

## Education

UNIVERSITY: **Gyeongsang National Univ**

DEGREES: BC in Computer Science (2005)  
BE in Mechanical Engineering (2005)

## Work Authorization

Permanent Residence(Green Card)

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# Skill Levels (1-5)

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Languages(FE)	Javascript (5), TypeScript (5), HTML (5), CSS/3 (5), SASS/LESS/SCSS (5)
Languages(Etc)	Java (5), YAML (5), SASS/LESS (5), Python (5), NodeJs (5), SQL (4), C#.Net (3), XML (3), LUA (3), C/C++ (3), JPA (3), Rust (2), Dart (2), Go (2)
Frameworks(FE)	React.js (5), Astro.js (4), Next.js (4), Solid.js (4), Svelte (3), JQuery (3), Angular 6 (2)
Backend skills	Node.js (5), Express (5), Jax-RS (4), Spring Boot (4), GraphQL (4), Flask (4), SQL Alchemy (4), Firebase/firestore (4), NextAuth (4), supabase (4), .Net (3), Elastic Search (3), Kafka (2)
Project/Pakcage Management	Vite (5), Turbo repo (5), Npm.js (5), Npm (5), pnpm (5), yarn (4), Nx Repo (3), Rush Repo (2), Rollup (2), Webpack (2)
State Libraries	jotai (5), zustand (5), Redux/Toolkit (5), React Context (5), React Hooks (5)
Shell Scripts	bash-sh (4), cmd-sh (3)
Test Framework	Playwright (5), Jest (5), Mocha (5), React TestingLibrary (5), Enzyme (5), sinon (5), Mockito (5), Cypress (5), Pytest (4), Vitest (4), Selenium (3), Spock (3)
database	My-SQL (4), MS-SQL (4), DB2 (4), Mongo DB (3), Postgres (3)
Dev Ops	Gialb-ci (4), Jenkins (4), Docker (4), Openshift (3), github-actions (2)
Machine Learning	TensorFlow/Keras (3), Jupiter Notebook (3)
Analysis Tools	Lab Windows/CVI (5), Matlab (4), Labview (3)
Documentation	JsDocs (5), ReadMe(md) (3)
Project Management	Agile/Jira (5), SAFE (5), SDLC (5)
Network	TCP/IP, UDP (5), RS-232/RS-422/MIL1553 (4), Analog/Discrete (4), GPS/GNSS (3), I2C (3)
Multimedia/Office	Flash/Action Script (5), Photoshop (4), Illustrator (4), Excel (4), PowerPoint (4), Word (3)

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# More Achievements

## Dimensional Fund Advisors

### #1 DFA Custom Chart Architecture

Suggesting a re-usable architecture that works for both PDF and UI. It is started to fix JSDOM memory leak while converting svg from D3 library to Base64 format. Existing code was mixed with html and svg as well as styles from CSS classes which makes impossible to pull SVG image with the same style.

Made an algorithm to calculate positioning of labels and chart items. Because of the special way of dealing with labels and baseline in the graph, this solution includes highly customizable.

MY ROLE: plan, architecture, and implement bar/line chart

BUSINESS VALUE: Created a modularized chart library to support the company design

### #2 Toggle Feature From UI

Suggesting an accessible way of toggle feature from UI and expandable and upgradable feature on backend. implemented automatic upgradable feature on the backend and frontend.

MY ROLE: participating design and architecture, and implement the features

BUSINESS VALUE: improve the internal and pilot user experience to try out the new features

### #3 Playwright BDD testing

creating a new project to support BDD style of testing that uses common language for tester and business owners. It improves the communication between developers and business owners. There was a useful library called playwright-bdd,

but its dependency with latest decorator syntax made limitation to the existing Jenkins system.

To continue using BDD syntax, made function name to have BDD style and it turned out supporting full typescript autocompletion.

Playwright has limits depending on versions, but the existing Jenkins system was running on the old version of node.

Still having limitation on e2e tests which only main branch has url for the playwright tests to run on,

I have created a docker container with running dev server and playwright tests in it so the team could validate the feature branch before merging to main branch.

There was a lot of huddles since the dev server was running pointing to the real services with authentication.

I have implemented certs creation in Vite configuration to make it work as well as adding test url in host file in docker-compose file.

I also made local testing environment for the developers can perform the further improvements.

MY ROLE: introducing BDD style regression test, implement BDD style regression test, creating test scenario

BUSINESS VALUE: improve communication between tester and test scenario creators, improve test creation/modify speed from the changed requirement

### #4 Refactor legacy code in fund/model center

the existing code in model center and fund center was written 2000+ lines of class components with a lot of prop drilling which makes code reusability and readability bad.

I refactored the code using Jotai 2.0 deleting a lot of prop drilling improving code readability and reusability.

While refactoring I converted javascript code to typescript code as well as creating a lot of types to reduce human errors in the future.

MY ROLE: plan, documentation, coding, testing(React, Typescript, Jotai 2.0)

**BUSINESS VALUE:** improve developer experience, code readability, reusability, and maintainability

#### **#5 Improve disclosure position on PDF using PDFMake**

Disclosure on the PDF make in DFA is dynamic in size, so making it on the bottom of the document is touch subject. I made disclosure manager to save all the disclosure data attached to the subjects that should be added to the page first, and made the disclosure based on the subject added in the page to decide which disclosure should be added. Also measured the size of the disclosure before it is added to calculate if it fits in the page.

**MY ROLE:** research on PDFMake, create new disclosure manager(React, Pdfmake)

**BUSINESS VALUE:** improve user experience, code maintainability

### **USAA**

#### **#1 Improve Pipeline performance of Small Business Insurance App**

improved pipeline speed by running the integration test scripts (cypress) conditionally depending on which development process (develop, feature, stage)

**MY ROLE:** script modification

**BUSINESS VALUE:** Improve Performance

#### **#2 Improve Response time of Small Business Insurance App(FE)**

architecture designs for the frontend taking advantage of react context and hooks. Code is modularized and categorized.

**MY ROLE:** architecture, code, leading, documentation

**BUSINESS VALUE:** Improve Performance

#### **#3 Improve Response time of Small Business Insurance App(BE)**

introducing microservice architecture on the backend, removing unnecessary service calls. improved performance from >30sec to <20sec. The system was leaning on 3rd party service which was spending most of times, so the improvement was limited.

**MY ROLE:** architecture, code, leading, analyzations, documentation

**BUSINESS VALUE:** Improve Performance

#### **#4 Bug fixes on Small Business Insurance App**

**MY ROLE:** analyzations, code, leading

**BUSINESS VALUE:** stabilize the app

#### **#5 Predicted Card Experience (Talon/New Web)**

I have merged existing FRS questionnaire application and dashboard application and created a new router structure to make them compatible to each other. Also, wrote multiple scripts to make the pipelines to leave proper evidence from the new projects.

I have consulted and made sure the new service follow micro-service concept and would make calls effectively between services.

**MY ROLE:** involved to the architecture design for the services and gave insights as a developer of existing services, update member home code and unit/functional tests, created and lead UI development from the base to the top using React Hooks/ Router/ Reducer (Jax-RS/React/OpenL/Spring/ NodeJs/DB2)

**BUSINESS VALUE:** show members predicted profiles instead of making members to start over for all the questionnaire to start to use Financial Wellness Tool

#### #6 Trust the member(Debt and Spending) (Talon/New Web)

**MY ROLE:** co-lead the team with the team lead, code review and debug, add horseshoe chart, lead the team, technical consult to the offshore teams, code reviews and debug(Jax-RS/React/OpenL/Spring/NodeJs/DB2)

**BUSINESS VALUE:** Improve member's experience, give member more specialized guideline adding more steps, show visual information about where the member is in the debt spending journey

#### #7 Trust the member(Emergency Fund) (Talon/New Web)

**MY ROLE:** Create service architecture, design DB, Write Flow Diagrams, Add visual sign on the card, Introduce TDD concept, add scenario system to handle the complex card transition, add flip card effect (Jax-RS/React/OpenL/Spring/NodeJs/DB2)

**BUSINESS VALUE:** Improve member's experience, give member ability to add their own EF values, show visual information about where the member is in the savings journey

#### #8 Upgrade Pipelines to use compliant modules

**MY ROLE:** implement x-ray, sonarqube, move repository to the managed repository(Gitlab-ci/bash/YAML)

**BUSINESS VALUE:** meet compliant policy, improve reliability

#### #9 Improve performance/reliability of the Financial Readiness app

I have reviewed the source code occasionally and found possible bugs. Also, I have participated to fix the errors found by other testers

**MY ROLE:** Found multiple possible system errors and fixed such as failure occurred by timing issues and version mismatch of network cache and jackson (Java/gradle/Jax-RS)

**BUSINESS VALUE:** meet compliant policy, improve reliability

#### #10 Create EasyUnit

Resource Objects are used overall server-client model.  
lombok covers a lot, but it does not create unit test.  
Easyunit create unit test and its vanilla java code.

**MY ROLE:** created easy-unit, introduce it to the team(Java/Mockito)

**BUSINESS VALUE:** save extra time to make unit tests for resource objects

#### #11 OpenL validation tool

When converting activity list to openl, it was enormous amount of data and multiple people worked on it. We didn't have a way to validate them so I have created parsers using excel and confirmed if the converted tables are equivalent to the original formula.

**MY ROLE:** created the validation tool, use it to validate the new file(Excel/Javascript)

**BUSINESS VALUE:** reduce human error when converting ActivityList from ERDC table(web) to OpenL(excel) by creating validation process

#### #12 Modernization of Financial Readiness site (Talon/New Web)

The legacy FRS(Financial Readiness Score) tool was built with Wicket, so we converted it using modern technology such as React/Jax-RS.

**MY ROLE:** worked as a team member on RESTful API and database

BUSINESS VALUE: improve performance, reliability and maintainability

## Eonic Korea

### #1 Create Circuit boards Test Solution

MY ROLE: creator of the software(Lab Windows/CVI, C/C++)

BUSINESS VALUE: Reduce the time to create similar tests

### #2 Harbor defense system

MY ROLE: Analyze the sonar data to detect multiple objects, create a UI to visualize the objects (Labview, FFT, Lab Windows, C/C++)

BUSINESS VALUE: Create Korean first active sonar with LIG Nex1

### #3 Passive sonar sytem for Submarine

MY ROLE: Develop high performing storage system

BUSINESS VALUE: Create passive sonar and store the sonar data with LIG Nex1

### #4 Sonar signal monitoring system

To achieve the performance requirement, I have create an architecture of multiple platforms/languages

MY ROLE: design the architecture, lead the sw team(Java/Javascript/C/C++/Intel IPP)

BUSINESS VALUE: handle high load data

## Realtimewave

### #1 Create TestNgine

TestNgine is a military level realtime test application which is upgraded from TestNetConnector that I have created and shared with the company members. This can download network test scenario to the real test object from drag&drop based application.

MY ROLE: creator of the software, created UI and participate on the service in the Realtime-OS.

BUSINESS VALUE: Being sold as Company's new product. Boost test process dramatically by removing the coding process by using drag&drop based UI

### #2 Create NetConnector

replace most of integration test with hardware with software test using NetConnector

MY ROLE: creator of the software(C#/C/Python)

BUSINESS VALUE: boost working efficiency at least 300%

### #3 Panel builder

generating LUA code automatically for the new avionics panels to generate a simulators.

MY ROLE: creator of the software(C++/LUA)

BUSINESS VALUE: give abilities to create a custom UI having multiple panels and network connections

### #4 Warning system in the nuclear power plant

Korean nuclear power plant has a warning system which is connected to the nuclear power plant. upgraded existing analog based warning system to the digital version.

MY ROLE: developer of the network system(C/bash)

BUSINESS VALUE: built a reliable warning system overall nuclear power plants

## #5 Research

perform as a researcher

MY ROLE: research of various area to evaluate the technical enability

BUSINESS VALUE: Research of RT-Java, GPS/GNSS monitoring, encoding intra-red video

## Personal Projects

### #1 Setting up mono repo for Resume Project

To make the project more maintainable before making next version of resume app, I have converted the project to Vite project living in the monorepo.

I have tried Nx repo before using turbo repo, but typescript support with vitest test

was not working as expected in the library. Turbo repo is a lot easier to set up the local packages.

It also supported vitest test using typescript source files. Converting html into vite project was smooth.

When I implement automatic PDF generation, It was hard to make it happen in server side generation since the file creation in monorepo is not common use case.

Eventually figured out by creating temporary endpoint that can give me multiple inner system information until I remove it to prevent security bleach.

MY ROLE: Personal Project(Turborepo, Vite, Vanilla JS/CSS/HTML), typescript, vitest, Next.js, PDF-Make, Solid-js

BUSINESS VALUE: Setup Turborepo, Test typescript/vitest test, Test Next.js app with test, Convert pure html project to Vite project

### #2 Menu App(QR in Menu)

Created Production level of application from planing to development. I have tried to make it using Next.js 13.0 which was still beta creating client side using Supabase, GraphQL, Typescript, TailwindCSS, Cloudflare Image, and SalesTax open source

library. While Next.js 13.0 was still on beta status, error messages was not very clear. At the similar time,

Astro 2.0 is released. For the admin tool of the menu app, I started using Astro 2.0. The development

environment is very good, especially the truth that I can use multiple javascript framework including

shvelt and solid.js. Could not release the production since the project team is finished for the personal

reason, but it was a great experience to learn a lot of tech stacks and schedule management.

MY ROLE: Personal Project(Next.js, Astro.js, React, TailwindCSS, Supabase, GraphQL, Typescript, Cloudflare Image, SalesTax)

BUSINESS VALUE: Created Production level application from A-Z as a solo developer.

### #3 Diagnostics of Parkinson's Disease

It was request from a Doctor(Yongsuk-Yang) in Korea and he wanted to know if Diagnostics using Deep Learning for the Parkinson's Disease using Blood analysis.

I received the results of blood analysis and proceed learning 3 levels of DNN after pre-processing.

the input node was 56, and output was 1 with percentage. after post processing, I could get meaningful result which find new patient as 90% accuracy.

MY ROLE: personal contract(Python/TensorFlow/Keras/Jupyter Notebook/Deep Learning)

BUSINESS VALUE: Found new patient with 90% of accuracy

### #4 SVG Designer

Open Source ([git@github.com:wootra/react-svg-designer.git](https://github.com:wootra/react-svg-designer.git))

MY ROLE: personal project(javascript/React/SVG)



BUSINESS VALUE: A Simple svg drawer supporting React style svg file export

### **#5 Horseshoe**

used for FRS debt and spending card

MY ROLE: personal project(javascript/SVG)

BUSINESS VALUE: small size SVG based chart software with no external dependencies (Opensource)

### **#6 Multi-domain redux**

it was before react hook comes out when I develop this. Now it can be replaced with React hooks reducer/context

MY ROLE: personal project

BUSINESS VALUE: enable users to use multi-domain of reducer

## **GNU**

### **#1 White board**

Instead of boring chatting, I gave the drawing functionality adding a fun factor.

MY ROLE: pair programming

BUSINESS VALUE: small chatting application with drawing ability

### **#2 Circuit simulator**

add AND/OR/XOR/NOT block in the board and give any signal by user to simulate the behavior of the circuit

MY ROLE: pair programming(Java/applet)

BUSINESS VALUE: give an ability to draw/simulate circuit design

### **#3 3D scanner**

MY ROLE: graduation paper project, perform as the sw programmer

BUSINESS VALUE: create a 3D image based on 2 pictures.