Ryoung Woo

Software Engineer · Data Scientist

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"I want to grow into a better mathematician and team player."

Summary

As a developer, I have grown up as a mathematician and team player for six years. As a mathematician, I enjoy thinking procedurally like a puzzle. At first, I should focus on small pieces. The sooner I predict the completed view, the faster I can solve the puzzle easily. As a team player, I enjoy cooperating passionately like a college basketball player. Whether break time in game or train time before game, we discussed a lot. What is needed, How to apply it, Which is better, finally Whether my team wins or not. I want to grow into a better mathematician and team player.

Experience

BISTel, Co. — *Seoul, S.Korea*

Software Engineer, Data Scientist — *Nov. 2013 - Present*

- Research on new technology of IT and academic paper. Share this with team.
- Gather requirement from external client and internal stakeholder.
- Develop or upgrade a product according to the above technology, paper, requirement.
- Deploy the product to client and Make them solve their problem.

Korea Information Engineering Services, Co. — *Seongnam, S.Korea*

Internship — *Sep. 2013 - Oct. 2013*

- Check quality assurance for product features to be released.
- Refine documentation for a user's point of view.

Education

Daejin University, Ministry of education, science and technology — *Seoul, S.Korea*

Completion of course, Hadoop expert for bigdata storage and management based on cloud computing — *May. 2013 - Aug. 2013*

- Because I completed this course well, I was able to participate in the internship.

College of Education, Kangwon National University — *Chuncheon, S.Korea*

Bachelor of Science, Mathematics Education — *Mar. 2004 - Feb. 2012*

- Scholarship on 1st year 2nd semester, 3rd year 2nd semester.
- Semi runner up of college basketball competition on 2nd year.

Project

Develop eDataLyzer — *Seoul, S.Korea*

Software Engineer, Data Scientist — *Nov. 2013 - Present, 5 years 10 months, more than 30 M/M*

- The eDataLyzer is a existing semiconductor analytics product for wafer yield map classification and root cause correlation.
- The goal of this project is to redevelop the eDataLyzer for big data.
- So we have led this project in three ways.
- 1st, reconstruct the architecture to micro services from monolithic one.
- 2nd, reorganize to a role based teams from a unified team.(Client, Server, Algorithm, Research, Technical Sales/Support.)
- 3rd, redevelop by Java and C# not only C#
- I belong to Algorithm team, mainly focusing on parallelizing algorithm by new big data technologies.
- In briefly, I have done three ways of parallelizing algorithms.
- 1st, I had redeveloped the algorithms by Java, PostgreSQL, Spring for small data clients.
- 2nd, I had redeveloped the algorithms by non Hadoop based technologies.(GreenPlumDataBase PL/Java, Oracle-R)
- 3rd, I had redeveloped the algorithms by Hadoop based technologies.(Hadoop, BDA, Hawq, HBase, Spark, Eco system)
- In this project, we have a lot of semiconductor clients.(Korea: Samsung Electronics, SKHynix, SKSiltron, Japan: Toshiba, Sharp, Taiwan: TSMC, China: BOE)
- And the project types are PoC, pilot, production.

Research to Apply Reinforcement Learning on Semiconductor

Seoul, S.Korea

Researcher, Software Engineer

Dec. 2018 - Present, 9 months, 6 M/M

- The goal of this project is to apply reinforcement learning on semiconductor and share the experience with team.
- I pick up 8-Puzzle as a environment for reinforcement learning.
- Here's why I pick up it in details.
- 1st, in order to collaborate with teammates, I need to find the generalized environment is easy to apply Graph Theory.
- So I pick up operation management of production on semiconductor.
- 2nd, in order to find suitable environment not complex one, I pick up 9-Puzzle.
- Focus on shortest path not yield, productivity, stability, automation rate, etc.
- The recent research situation is as follows.
- 1st, solve 8-Puzzle by Dynamic Programming
- 2nd, fail to solve 8-Puzzle by QLearning, Deep SARSA, Polish Gradient.
- The rest of the research is to find out why and how to overcome it.

Develop Matrix Profile on Transfer System

Seoul, S.Korea

Software Engineer

Jul. 2017 - Dec. 2017, 6 months, 2 M/M

- The goal of this project is to predict a shutdown of motor based on time series sensed data.
- Client's product-lines(blue-collars) found out a shutdown once a year and hate this problem.
- But both client's office-lines(white-collars) and our previous algorithm didn't predict it.
- Because the algorithm focus on a vibration analysis on rotationary machine.
- So we created this project as a subproject of the previous one and led this project as below.
- 1st, we found out the matrix profile which is a suitable algorithm for time series predict.
- 2nd, I implemented the algorithm in python and deploy it to client. And solve the problem successfully.
- 3rd, I implemented it in java and integrate with UI. Teached clients how to solve their problem through our product.
- The client of this project is Hyundai Motor. And the project type is PoC.

Develop Predictive Maintenance on Semiconductor

Seoul, S.Korea

Software Engineer

Nov. 2016 - Mar. 2017, 5 months, 4 M/M

- The goal of this project is to provide predictive maintenance on semiconductor's etching tools.
- In order to change client's empirical maintenance(condition, time), we led this project as below.
- 1st, redefine input data through Self Organizing Map. And define health score as distance of each vectors of input data and observation vector.
- 2nd, apply Double Exponential Weighted Moving Average to the health score. And get Remaining Useful Life for each vectors of input data.
- But we got a feedback that our product was too late for client. So we additionally led this project as follows.
- 1st, detect the bottle neck of our product as the DEWMA not the SOM.
- 2nd, apply Spark and HDFS on the DEWMA. And find out a tuning point.
- For example, Depends on data's variety and volume, use dynamic number of dfs.replication not static default 3.
- The client of this project is SKHynix. And the project type is pilot.

QA & Documentation on new Product

Seongnam, S.Korea

Internship

Aug. 2013 - Oct. 2013, 3 months, 5 M/M

- During the internship, I did the following activities.
- 1st, quality assurance for each feature on new product.
- 2nd, modify the previous document by the user's perspective.

Skills

Programming
- Java, SQL, Python
- In production level, I have used Java, SQL for 6 years.
- In papers or conception level, I have used Python for 2 years.

Backend
- Spring Frameworks
- Using this, we can re-construct the previous monolithic application into micro services architect.
- Using this, we can re-build the previous configure hell party into AOP based application.

Database
- Oracle, PostgreSQL, HBase
- I used the Oracle because it's used by most semiconductor clients.
- I used the PostgreSQL because it's a alternative of the Oracle. It's easy to use and especially good for performance over price.
- I used the HBase because it's a alternative of the Oracle. It's hard to use but better than the PostgreSQL on performance.

Bigdata
- Java, GPDB, Hadoop, Spark
- We realized that it takes a long time to extend my previous product to big data with Java alone (Multi-Threading, Networking).
- In order to reduce the time, we find out the following Bigdata platform which enable us to focus on business logic of the product.
- 1st, GPDB PL/Java is a static platform which enable us to handle data by SQL, compute data by PL/Java.
- 2nd, Hadoop Spark is a dynamic platform which enable us to handle and compute data by Java. Using Hadoop with other platform not Spark, we couldn't overcome PoC.

ML/AI
- Nvidia CUDA, Keras, Tensorflow
- I used the above skills for Time Series data mining and Reinforcement Learning project.

DevOps
- Linux, Docker, On premise Cloud(KVM), Public Cloud Azure, AWS
- I used the above skills for support projects.

Research
- Read and implement the latest papers by python.

Leadership
- I have experience of leading two projects successfully for a year.

Communications
- I have smoothly communicated with the aggressive client, the various teammates and the academic advisor for government.

Languages
- Native in Korean
- Limited working proficiency in English.