**Consent to the collection of personal information**

The Rising Star Heading Co., Ltd. (hereinafter referred to as the "Company") values the personal information of job applicants (hereinafter referred to as "Applicants") and complies with the "Personal Information Protection Act". In accordance with Articles 15, 17, 23, and 24 of the Personal Information Protection Act, the Company informs you of the purpose and method of using the personal information provided by the applicant and obtains consent to the collection and use of the information. Applicants may refuse to agree to the 'A', 'I', 'C', and 'D' items below, and if they do not agree, they may be disadvantaged by being excluded from the recruitment screening.

**A. Personal Information**

|  |  |
| --- | --- |
| **Division** | **My Dragon** |
| Items of personal information to be collected | Name (Korean/Hanja), date of birth, gender, legal address, address, e-mail, home phone number, mobile phone number, education, work experience, smoking status, family status, military service status, hobbies, marital status, blood type, height, weight, eyesight, hearing loss, health status, labor office job search status, special skills, eligibility for veterans, qualifications and licenses, foreign language skills, OA literacy, typing ability, internet literacy, credits, housing type |
| Purpose of collection and use of personal information | Determination of suitability for employment (However, in the case of new employees, the purpose of personnel management is added) |
| Period of Retention and Use of Personal Information | From the date of provision until the time of termination (deletion request, etc.). (However, in the case of joining the company, it is up to 3 years after retirement.)  In addition, upon termination, the Company will immediately destroy the applicant's personal information in a way that makes it impossible to reproduce, and if the personal information is provided to a third party, the Company will instruct the third party to destroy it as well. |
| Disadvantages for refusal of consent | Exclusion from Recruitment Screening |

**● Do you agree to the collection and use of your personal information? ( √ ) I agree. I disagree.**

**B. Unique Identification Information**

|  |  |
| --- | --- |
| **Division** | **My Dragon** |
| Items of personal information to be collected | Date of birth |
| Purpose of collection and use of personal information | Personal identification (However, in the case of a new employee: Employment contract, enrollment in the 4 major insurances, issuance of certificates, and the purpose of welfare support are added) |
| Period of Retention and Use of Personal Information | From the date of provision until the time of termination (deletion request, etc.). (However, in the case of joining the company, it is up to 3 years after retirement.)  In addition, upon termination, the Company will immediately destroy the applicant's personal information in a way that makes it impossible to reproduce it, and if the personal information is provided to a third party, the Company will instruct the third party to destroy it as well. |
| Disadvantages for refusal of consent | Exclusion from Recruitment Screening |

**● Do you agree to the collection and use of unique identification information? ( √ ) I agree. I disagree.**

**C. Sensitive Information**

|  |  |
| --- | --- |
| **Division** | **My Dragon** |
| Items of personal information to be collected | Medical history, disability, religion |
| Purpose of collection and use of personal information | Preferential treatment under the Employment Promotion Act for Persons with Disabilities |
| Period of Retention and Use of Personal Information | From the date of provision until the time of termination (deletion request, etc.). (However, in the case of joining the company, it is up to 3 years after retirement.)  In addition, upon termination, the Company will immediately destroy the applicant's personal information in a way that makes it impossible to reproduce, and if the personal information is provided to a third party, the Company will instruct the third party to destroy it as well. |
| Disadvantages for refusal of consent | Exclusion from Recruitment Screening |

**● Do you agree to the collection and use of sensitive information? ( √ ) I agree. I disagree.**

**D. Provision of Personal Information to Third Parties**

|  |  |
| --- | --- |
| **Division** | **My Dragon** |
| Recipient of Personal Information | **The Rising Star Heading** |
| Items of personal information to be provided | The above A~C term |
| Purpose of collection and use of personal information of the recipient | Determination of suitability to perform the job. (However, in the case of new employees: preparation of the employee list, preparation of the dispatch business management register, preparation of the use business management register, payment of wages, enrollment in the four major insurances, issuance of certificates, and the purpose of welfare support is added) |
| Disadvantages for refusal of consent | Exclusion from Recruitment Screening |

● Do you agree to the provision of personal information to third parties? **( √ ) I agree. I disagree**

**April 13, 2024 Applicant: Kyungseop Shin (In)**

**Application form**

**Field : MES Team\_SRE Group\_SRE Solution Part Experience**

**Personal Information**

* 성 명: 신경섭 (kyoungsup shin)
* Date of Birth: 1992-04-12 (Age 32)
* Address: 102-2703 Pentaport, Buldang-dong, Seobuk-gu, Cheonan-si
* 주 소: (현재 실리콘밸리 주재원 근무) 550 moreland way, santa clara, California
* 연 락 처: 휴대폰: 010-5389-0749 E-mail: sks8803@gmail.com
* Soldier Role: Army Sergeant Term Discharge (2012.03 ~ 2013.12)
* Honor: Nothing
* Current annual salary: 67,500,000 won
* Desired salary: According to the company's bylaws
* Join us: May 31, 2024

**Education (Chungbuk National University)**

2011.03 ~ 2018.02 Chungbuk National University(Chungbuk) Department of Advanced Materials Engineering Bachelor's Graduation

2008.03 ~ 2011.02 Cheonan Oseong High School (Chungnam) graduation

**Core competencies (job skills / skills possessed / business strengths)**

Please describe about 5 experiences (projects) and strengths that you think are the best fit for the position.

* Business Insights Data Analysis
  + Configure pipelines for ETL, Query, and Visualization to automate data tasks.
  + B2C and B2B services Back-end data error analysis, time series prediction with multivariate variables, and geometry data visualization.
  + 물류 G-ERP분석을 통해 물류 Loss, Bottleneck 검증 분석.
  + Real-time product BEP calculation through logistics, sales, and management data BI and visualization.
* Cost Reduction and Work Automation Smart Factory
  + Development of recipe APC, R2R system through PECVD, Etching, and Patterning facility data analysis.
  + Planning, designing, and implementing machine vision cameras in various processes to automatically detect defects that occur in factories and introduce AI technology.
  + In the case of continuous occurrence of AI detection of the same defect, MES alarm is generated and process line control is implemented.
  + Implementation of AI detection data result-based facility control through PLC MC protocol interface.
* Cloud & Server for AI Adoption
  + On-premise Linux (CentOS)-based smart factory server construction and implementation.
  + Build agile services using Azure, AWS CS, and introduce and implement AI services.
  + Design, implement, and implement IaaS, PaaS, and SaaS applications for PowerBI.
* RAG LLM Planning & Implementation
  + Planning to introduce LLM RAG system for the introduction of Tech sensing.
  + RAG CoT기술을 이용한 Routing & Web crawling 기능 구현.
  + PDF, Youtube, Docx, PPTX, etc. RAG implementation and Map-reduced summary implementation.

**Career (6 years and 8 months in total) / Relevant experience (5 years 10 months)**

2018.07 ~ In service(5 years 10 months) (Note) Hanwha Solutions Strategic DT Room Data Scientist

2017.09 ~ 2018.06(00 years 10 months) (Note) Canon Semiconductor Lithography Team Facilities Engineer

**Detailed Career Description**

**2018.07 ~ Incumbent(5 years 10 months) (Note) Hanwha Solutions Strategic DT Room Data Scientist**

**[ About Us ]**

Hanwha Solutions is part of the Energy & Environment Division of Hanwha Group. The company develops and provides a wide range of energy solutions and environmental technologies.

**[ Responsibilities ]**

As a data scientist and analyst, I work on projects focused on machine learning development, data analysis, and BI development.

**[ Detailed Responsibilities ]** Major Achievements/Achievements, etc. (Please focus on the hiring position)

* Hanwha Q CELLS CTO Implementation of Tech sensing RAG System [2023.10 - 2024.04]

Problem) Lack of system for tech sensing, difficulty in quickly understanding high-level knowledge and technology.

Method) Question new technical documents using LLM RAG technology.

Implementation) RAG, Document Translation, and Report Generation through MyDocument RAG using CoT technology.

Effect) Search the contents of the designated website with RAG to easily understand the information and generate reports to streamline work.

* Hanwha Q CELLS Korea Sales Corporation Management Information and Logistics Visualization [2023.02-2023.10]

Problem) Management, sales, and logistics data visualization work requires a lot of time to prepare reports, and new data reflection delay work loss.

How to) Configure dashboards via PowerBI and support real-time updates via Graph API.

Implementation) Implement ETL development with PostgreSQL View table on AWS, and modernize data with real-time Graph API Batch. SQL automation for your business.

Effect) Management, sales, and logistics report work, which relied on Excel and e-mail, have been digitally systemized in line with the introduction of G-ERP. Reduce work hours by more than 50 hours/day and share information

* Hanwha Q CELLS U.S. G-ERP SCM ATP and Inventory Visualization [2022.03 - 2023.06]

Problem) Visualization of logistics that relied on Excel and e-mail to be digitally systemized in line with the introduction of G-ERP

How to) Configure dashboards via PowerBI and support real-time updates via Graph API.

Implementation) Implement ETL business for logistics data based on Azure resources with SQL and Airflow DAG, and modernize data with real-time Batch.

Effect) Visualization of logistics inventory reduces working hours by more than 20 hours/day and information sharing.

* Hanwha Q CELLS U.S. Sales Corporation B2C Customer Rewards Homepage Data Analysis [2021.12 - 2022.01]

Problem) Visualizing customer patterns through data analysis. Bug in calculating points for Rewards.

Method) Trace customer transaction data with reverse engineering Node.js code.

Implementation) Reward Calculation ORM function takes action after confirming that the error handling logic for Disconnection is insufficient.

Effective) Implement auto-detection logic to solve the problem by sending an email system.

* Hanwha Q CELLS DES Development of Predictive Modeling for Solar Power Generation [2021.07 - 2021.11]

Problem) Implementation of pre-modeling prior to the implementation of VPP and Energy Grid Generation Forecast Incentive Schemes.

Method) Machine learning modeling by configuring historical forecast data and power generation pairs. Self training based on development time decay method.

Implementation) 10 site weather forecast API data acquisition, preprocessing, real-time prediction program development through XGBoost, and GRU models.

* Hanwha Q CELLS Cell Manufacturing Corporation Etch Process Recipe APC Development According to WIP [2021.03 - 2021.06]

Problem) In the etching process, there are many etch rate defects due to the change in etch rate according to the amount of WIP.

Method) R2R method that predicts the WIP quantity in a short period of time and changes the process speed recipe in real time.

Implementation) Development of MES and interfaces, calculation of optimal process speed with multivariate GRU and current WIP inventory data. Develop a recipe results interface with your LMS.

Effect) Changing the equipment speed rather than changing the recipe did not improve the product efficiency, but it prevented the occurrence of a large number of defects.

* Hanwha Q CELLS Module Manufacturing Corporation Junction Box Soldering Developed Automatic Detection of Defective Images [2021.01 - 2021.05]

Problem) Product contact defects occur intermittently due to various reasons in PB soldering during the process after the module.

method) Use Yolov5 to recognize the specified defective Coordinate, Class and control the defective response facility.

Implementation) Introduction and installation of machine vision camera and lighting, GUI development and defective object detection modeling, MES reporting on the occurrence of defective continuation, DB storage of result data, and visualization of patterns with Spotfire.

Effectiveness) With the introduction of the detection system, it is possible to detect automated defects, and it is used to determine which process line has many problems and plan PM, BM.

* Hanwha Q CELLS Cell Manufacturing Subsidiary Developed Automatic Detection of Defective Images in Patterning Process [2021.01 - 2021.05]

Problem) Bulge and patterning loss problems cause product quality deterioration and poor handling. Most often patterning is caused by material payment control failures.

method) Use Yolov5 to recognize the specified defective Coordinate, Class and control the defective response facility.

Implementation) 8K (50MB) high-capacity image file Bytes I/O GPU distributed processing development, GUI development and defective object detection modeling development, MES report on the occurrence of the same defect continuously, result data DB storage and visualization of defect patterns with Spotfire.

Effectiveness) With the introduction of the detection system, it is possible to detect automated defects, and it is used to determine which process line has many problems and plan PM, BM.

* Hanwha Q CELLS Cell Manufacturing Corp.Etch Process Developed Automatic Detection of Surface Defects [2020.10-2021.06]

Problem) Defects occur due to wafer breakage, etching rate drop, and particle issue in the wet etch process.

method) Use Yolov5 to recognize the specified defective Coordinate, Class and control the defective response facility.

implementation) introduction of machine vision cameras and lighting. GUI development and defective object detection modeling development. After saving the result data DB, the defective pattern is visualized with Spotfire. MES report on the occurrence of the same defect continuously.

Effect) Introducing real-world machine learning image analysis capabilities. A large number of defects could be prevented in real time, and cost savings were reduced by eliminating broken wafers in advance.

* Hanwha Q CELLS Cell Manufacturing Corporation PECVD Process Thin Film Recipe APC Development [2020.01 - 2020.05]

Problem) Issues continue to occur in the process output of thin films due to the continuously changing environmental values in the PECVD process.

R2R method to predict thin-film process result data in a short period of time to change process speed recipes in real time.

Implementation) Implementation of derivation of optimal recipes for maintaining process targets through PECVD vision camera thin film thickness measurements. Development of an automatic process recipe control system based on PECVD process thin film thickness data.

Effectiveness) Continuous thickness adjustment of PECVD improves the quality stability of thin film thickness by more than 25%.

* Hanwha Q CELLS Cell Manufacturing Corporation Post-Process Blackspot Process Improvement EL Image Analysis Development and Operation [2019.12 - 2020.05]

Problem) Detect Blackspot with defective reading data from the post-cell process. Defective patterning images can be checked according to the quality level. Dozens of defective image patternings are visually inspected by more than 30 quality team technicians, resulting in inefficiencies.

method) Recognize the specified defective class using ResNet and control the defective response facility.

Implementation) Implementation of Classification based on ResNet to detect more than 30 types of defects in real time. Pattern results are stored in DB and visualized with Spotfire. Detects defective patterns, sets up the causative process with XGBoost-based importance, and proceeds with recipe testing.

Effect) Find a major issue process and solve more than 40% of Blackspot's problems with a refine recipe.

* Hanwha Q CELLS Cell Manufacturing Corporation Process & Facility DataSpotfire Dashboard Report Management & Operation [2019.01 - 2020.12]

Spotfire-based process and facility data report module management and operation.

Development of outlier data management module for each process facility.

Manage and operate product-specific KPI management modules.

In case of product defects and abnormalities, development of reporting to derive importance through machine learning-based (random forest, decision tree).

Development of process part abnormality data collection and reporting module using MSSQL.

**Languages**

* English Communication Skills (Prize)

**Certification**

* ADsP [Data Promotion Agency/2021.12]
* SQLD [Data Promotion Agency/2021.07]

**Computer 능력**

* Python, Javascript
* MSSQL, MySQL, PowerBI, Spotfire
* Linux, Docker, Azure, AWSS

**Personal Statement:**

**[LLM RAG Related Projects]**

We designed and implemented a system to quickly improve the technical capabilities of the CTO organization and to facilitate the understanding of difficult and diverse papers. As an initial direction, we wanted to take a new approach with Tech sensing through LLM RAGs.The LLM RAG system features that I have planned and implemented are as follows.

1. Translation Function Maintains Document Format

2. Summary of Single and Multi-Document RAGs and Map-reduced

3. YouTube RAG 및 Map-reduced 요약

4. 웹 HTML RAG 및 Map-reduced 요약

5. CoT 기반 Route & React Agent 구현

6. Implement Crawling Agent tool for in-house domain papers, journals, news, manuals, and policy-related sites

There were a variety of challenges during the implementation of the RAG system. In particular, it was very difficult to derive user awareness and specific needs. There was a misunderstanding of LLM technology as 'analysis' and 'generate' results, and there was a lack of awareness of hallucination. Therefore, we adopted a strategy of using data from a source. In addition, new technologies and news were published in a variety and rapidly, making it difficult to fine-tune LLM models. In addition, each member's interests and needs were diverse, making it difficult to deal with documents that existed in various formats. As a result, there were resource constraints to convert all existing technical documents into an embedding vector and store them in the knowledge database. Therefore, we adopted a strategy of searching, analyzing results, and writing reports on "sites of the information we want".

My key strategies at RAG Agent are:

1. Identify the intent of the questioner and select a task. e.g. patent data search, policy search, search for specific technology, etc.

2. Select a data source for the RAG. e.g. Google patent, Google scholar, etc.

3. Select the search terms you want to use on your data source site. Example: Use search terms such as "Tesla self-driving" to search for information about Tesla's self-driving technology.

In addition, it has been implemented so that it can be analyzed using CoT technology. If you don't have a suitable deliverable, you can search for it on another site and crawl it. However, when dealing with long source data or multiple data sources, the Token limit problem arose. To solve this problem, we have introduced a method of creating a temporary VectorIndex for long sentences and performing a hybrid retrieve. This project will enable a wide range of people to provide answers to questions, collect data from multiple technology sites, and provide the ability to create reports.

I can use my LLM RAG technology to redesign documents such as MDLs and SOPs for version control and Q&A. In addition, it is possible to create an AI assistant that can discover insights through various forms of unstructured data.

**[Motivation for applying]**

I majored in Advanced Materials Engineering. However, when I first joined Hanwha Q CELLS, I was offered a data management job to manage KPIs within the team through BI. At that time, I was studying SQL and BI, and I was curious about process issues and data as I connected and viewed each process data in a relationship. I decided to challenge a new field by identifying the causes of process issues through data analysis and finding out if they could not be solved. In this way, I started studying statistics and machine learning analysis, and after two years of personal study, I was able to develop an image classification system based on CNN ResNet and solve process issues.

Starting with this, we have repeatedly challenged, applied, and failed various AI applications such as object recognition, data visualization, business analysis, and LLM RAG. Some failed due to a lack of user awareness of AI, and some had performance issues. However, we did not give up and tried to fit the user's shoes as much as possible. In addition, I realized that domain knowledge is very important in data analysis, and I have been trying to get know-how and information from various people in charge of the field. As a result, I was able to learn about general functions in logistics, ERP, sales, management, and CTO, and I would like to introduce AI technology in various business fields.

While working in the Strategic DT Office, I was exposed to several collaboration tools and a new DT platform. I will share the methods used by IT and DT organizations that work organically and quickly. In addition, we will contribute with the following 4 types of expertise.

1. We will quickly understand the process ERP data and build an automated data analysis pipeline using Airflow to build a data lake or mart.

2. We will develop and build machine learning modeling to build a complete detection system to fully manage Goods Issue.

3. We will introduce machine vision cameras where necessary to obtain POC data and discover and develop new projects.

4. We will build a BI system by visualizing real-time gender data for data-driven business decisions with collaborative departments.

**[Personality Pros and Cons]**

I have successfully completed several projects with an agile approach and problem-solving skills. In the process of developing and implementing new ideas or services, we have achieved outstanding results through quick decisions and execution. I've always tried to lead projects with the big picture in mind, and use them to create innovative solutions. In addition, through collaboration with colleagues, they communicated and collaborated efficiently to achieve the team's goals.

However, with this agile approach, we often feel pressured to get things done quickly. As a result, there were times when the operational aspect was neglected. Sometimes we tend to overlook the details and focus on the big picture. There was also a tendency to get so attached to new ideas that they ignored past experience or proven methods. As a result, the stability and longevity of the project have been overlooked.

In order to secure this nature, we tried to use multiple platforms to focus on operational planning and detail. As much as possible, we use the JIRA and Ticket methods to determine the areas that need to be supplemented, and we are trying to collect opinions with our team members.

**We confirm that the above information is not false.**

**April 13, 2024**

**Applicant : Shin Kyung-seop**