Nie Pengfei

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SUMMARY

CARIAD China | Architect May. 2019 – Present
Netease Hangzhou | Senior Java Software Engineer Oct. 2017 – May. 2019
Citigroup Financial Information Services | Senior Java Software Engineer Oct. 2015 – Oct. 2017
UniSysTech Consulting Hefei | Junior Java Software Engineer Oct. 2013 – Sep. 2015

Experience

CARIAD China LTD Hangzhou, China May. 2019 – Present

volkswagen v2x shelf platform June. 2024 – Present

Introduction: Design and provided software SDK on Volkswagen's v2x product line.
Technology: AOS(Cariad SE Alliance, autonomous driving middleware),TROS(Horizon Robotics), VW.OS, C++,CMake,conan etc.
Responsiblity:
1. Technological architecture evolution

- Led the software SDK design and implementation for Volkswagen's V2X product line.
- Integrate and optimize V2X software on Horizon Journey 5, Autotalks and Nebulalink.
- Advanced middleware technologies such as AOS and TROS have been adopted to improve the compatibility and scalability of the system.
- Supports AOS (Autonomous Driving Middleware), TROS (Horizon Robotics Middleware), and VW.OS middleware platforms.

2. Core system construction

- Responsible for road testing and data collection, ensuring the reliability and stability of the V2X system in actual driving environments.
- By accurately collecting and analyzing road test data, continuously optimizing system performance.
- Establish a laboratory scenario data simulation mechanism and a road test data replay system to enhance development efficiency.
- By utilizing tools such as CANoe, conducted rigorous simulation testing on the V2X communication module to ensure high availability and security of the system.
- Implemented the definition of relevant scenarios for C-NCAP 2024 and C-NCAP 2027.

3. Improvement of research and development efficiency

- Promoted the standardization of code quality and development processes, and introduced the Conan package manager to streamline dependency management.
- Organized and participated in multiple technical workshops and knowledge-sharing sessions to facilitate knowledge exchange and enhance technical capabilities among team members.
- Developed comprehensive development guidelines and best practice documentation to assist new members in quickly getting up to speed and continuously improving the development process.

volkswagen NGX 2.0 - Core Middleware Oct. 2023 – June. 2024

Introduction: Developed a domestically-produced software platform for L2++ level autonomous driving, initially integrated with the Horizon Journey series chips.
Technology: AOS(Cariad SE Alliance, autonomous driving middleware),TROS(Horizon Robotics), VW.OS, C++,CMake,conan etc.
Responsiblity:
1. Technological architecture evolution

- Spearheaded the deep integration of VW.OS with the Journey 5 chip.
- Designed the Hardware Abstraction Layer (HAL) to enable seamless utilization of the Journey 5 chip's computing power by VW.OS.

- Integrated cross platform communication framework, supporting real-time data exchange between NXPS32G and Journey 5 chips.

2. Core system construction
   - Responsible for VW.OS and TROS software development and integration on Journey 5 and S32G.
   - Responsible for software component porting experience in AOS and TROS.
   - The full-feature porting of VW.OS onto the Journey 5, supporting applications such as ADAS and V2X.
3. Improvement of research and development efficiency
   - Implemented component-based builds using Conan and CMake to enhance compilation efficiency.
   - Authored technical documentation such as the «VW.OS Porting Guide» and «TROS Development Manual».
   - Established a knowledge base system to enhance team collaboration efficiency.

volkswagen E3 2.0 - v2x preprocessing Jan. 2022 – Oct. 2023

Introduction: Developed the world's first vehicle communication platform supporting multi-country V2X protocols, enabling V2X communication standards for Volkswagen Group brands.
Technology: AOS,iceoryx,C++,CMake,conan etc.
Responsiblity:
1. Technological architecture evolution
   - Implemented a standardized abstraction of V2X protocols for regions such as the EU, China, and North America based on the AOS communication framework, enhancing protocol compatibility.
   - Utilized iceoryx zero-copy communication technology to achieve multi-source sensor data fusion, reducing message processing latency to the microsecond level.
   - Promoted toolchain upgrades: Implemented a build system based on Conan and CMake to enhance cross-platform compilation efficiency.
2. Core system construction
   - Achieved deep integration of the C-V2X protocol stack with 4G/5G networks, enabling vehicle-road-cloud collaborative communication.
   - Developed a message processing engine compliant with Chinese, American, and European standards, supporting scenarios such as emergency brake warnings and intersection collision warnings.
   - Designed a fusion and tracking algorithm based on Kalman filtering to improve target tracking accuracy and fusion precision.
   - Responsible for integration in vehicles, application and customer release of V2X functions of E3 2.0 for the Volkswagen Group brands in the Chinese market.
   - Responsible for system, function quality and project quality.
   - Responsible for implementing and execution of SW development activities on all levels (components, functions, testing, release) and ensure the harmonization and cooperation.
   - Responsible for implementing functional and software specification and development requirements, vehicle software interfaces definition of related hardware and software.
3. Improvement of research and development efficiency
   - Formulated technical standards such as the «V2X Development Specification Manual», reducing the onboarding cycle for new teams.
   - Promoted R&D asset reuse: Built a cross-brand software component library, increasing code reuse rates.
   - Developed SIL (Software-in-the-Loop) and HIL (Hardware-in-the-Loop) testing platforms, shifting the issue detection phase earlier in the development cycle.

volkswagen Robotaxi Tiger Jan. 2020 – Dec. 2021

Introduction: The Volkswagen Robotaxi autonomous taxi project is dedicated to creating a safe, efficient, and fully automated driverless taxi service, offering users a convenient and environmentally friendly future mobility experience.
Technology: Spring Boot,Spring Cloud,Spring MVC,MyBatis,MySQL,Redis,Kafka,K8S,docker etc.
Responsiblity:
1. Technological architecture evolution
   - Designed a distributed architecture based on SpringCloud to decouple core modules such as trip services, dispatch services, and management platforms.

- Built a high-concurrency dispatch engine, utilizing Kafka message queues to achieve real-time vehicle status updates.
- Provided solutions for the legality of GEO data.
- Implemented automated deployment and elastic scaling of services using K8S and Docker, improving resource utilization.
- Initiated and led the core team for the Robotaxi program analysis, responsible for the development of the program analysis system and platform construction.
- Oversaw architecture design and business implementation, including the design and development of trip services, dispatch services, and the management platform.

2. Core system construction

- Developed the trip service module: Implemented core functionalities such as passenger order placement, route planning, and point calculation.
- Designed a JWT-based interface encryption scheme to ensure secure data transmission.
- Optimized dispatch algorithms to improve vehicle matching accuracy and reduce idle rates.
- Enabled real-time issuance of vehicle control commands and status monitoring, enhancing command execution success rates.
- Designed the management platform, providing features such as vehicle status monitoring, trip tracking, and data analysis to support operational decision-making.
- Developed a real-time alert system to shorten response times to abnormal events.

3. Improvement of research and development efficiency

- Established a DevOps pipeline to achieve CI/CD automation, reducing the version release cycle.
- Integrated a monitoring and alerting system to shorten response times to production issues.
- Formulated microservice development standards to improve code reuse rates. Created a technical documentation library to reduce onboarding time for new members.

volkswagen cns3sop2 content management system(CMS) Mar. 2019 – Jan. 2020

Introduction: Content Management System (CMS) is a software platform that enables users to easily create, edit, manage, and publish digital content.
Technology: Spring Boot,Spring Cloud,Spring MVC,MyBatis,MySQL,Redis,Kafka,K8S,docker etc.
Responsiblity:

1. Technological architecture evolution

- Designed a microservices architecture based on SpringCloud to decouple core modules such as content management, user permissions, and cloud storage.
- Built a high-availability storage solution by integrating Huawei Cloud OBS, enabling petabyte-scale content storage and supporting the upload, download, and distribution of massive files.
- Designed a Redis+Kafka caching and message queue system, increasing system throughput and reducing core interface response times by 50%.
- Promoted containerized deployment, achieving automated deployment and elastic scaling of services using K8S and Docker, improving resource utilization.

2. Core system construction

- Developed the core content management module: Enabled unified management and publishing of multi-format content (text, images, videos).
- Designed a JWT-based interface encryption scheme to support secure access for in-vehicle devices.
- Built a permission management system: Implemented a hybrid RBAC+ABAC permission model, supporting multi-dimensional authorization for users, roles, and resources.
- Developed audit log functionality, enabling real-time tracking and backtracking of operational records.
- Designed a CDN acceleration solution to improve content loading speed.
- Implemented content version control, supporting quick rollback to historical records.

3. Improvement of research and development efficiency

- Integrated a DevOps pipeline to achieve CI/CD automation, reducing the version release cycle.
- Implemented a monitoring and alerting system to shorten response times to production issues.
- Established microservice development standards to improve code reuse rates. Created a technical documentation library to reduce onboarding time for new members.

Netease Hangzhou (China) LTD Hangzhou, China Oct. 2017 – May. 2019

Netease Kada Oct. 2017 – May. 2019

Introduction: Kada is a programming education solution provider covering the K12 stage. https://www.kada.com
Technology: Spring Boot,Spring Cloud,Spring MVC,MyBatis,Dubbo,Redis,MySQL,Eureka,Zookeeper etc.
Responsiblity:

1. Technological architecture evolution
   - Lead the business module splitting and microservice refactoring, and build a hybrid architecture based on SpringCloud+Dobbo.
   - Independently developed database read-write separation middleware, capable of handling millions of requests per day, and promoted its use in the company's technical center.
   - Customized Dubbo service downgrade component based on open-source Hystrix, achieving dynamic configuration of circuit breaker threshold and improving service availability to 99.95%.
2. Core system construction
   - Designed an intelligent routing mechanism for the review system, enabling automatic allocation of review tasks and improving processing efficiency by 40%.
   - Developed a dynamic table rendering engine, supporting Excel-style complex form configurations and serving multiple course project activities simultaneously.
   - Built standardized interfaces to unify third-party resource integration specifications, reducing integration costs by 60%.
3. Improvement of research and development efficiency
   - Promoted the standardization of the technical system, led the implementation of SCM+Overmind (NetEase self-developed), achieving multi-environment configuration isolation and one-click deployment.
   - Established a code quality control system, formulated a code review checklist, and increased unit test coverage of key modules to 85%.
   - Mentored 3 interns to quickly become proficient in core development, organized 15+ technical sharing sessions, and documented over 20 technical articles.

Citigroup Financial Information Services (China) LTD Shanghai, China Oct. 2015 – Oct. 2017

Citi Document Master Central(DMC) Dec. 2016 – Oct. 2017

Introduction: Citibank's global document management core system, provide document storage, management, sharing and permission control for various departments.
Technology: Spring MVC,TibcoJMS,MyBatis,Oracle,Jersey,MongoDB,Ativio,Redis etc.
Responsiblity:

1. Technological architecture evolution
   - Lead the front-end and back-end separation transformation of the system, and design a RESTful API based on the Jersey framework.
   - Support core functions such as document upload, download, and permission verification, and improve system response performance by 35%.
   - Implement microservice based metadata extraction, using SpringBoot+Activio to build service modules.
   - Supports automatic parsing of 10+formats such as PDF/Word/Excel, with an accuracy rate of 98.5%.
   - Design an asynchronous messaging system based on TibcoJMS to achieve real-time notifications of document property changes, permission updates, and other events.
2. Core system construction
   - Participate in the development and improvement of the core function modules of the project: authority control, document uploading and downloading, metadata automatic Extraction and so on.
   - Participate in the performance test and performance tuning of front-end and back-end communication of the project, increasing the effective text transmission volume by 30%.
   - Participate in the separation of front and back end of the core functions of the project, design and implement relevant Restful API.
   - Micro-service Design and Implementation of Metadata Automatic Extraction Function Module.
   - Participate in auto-based automatic script development and maintenance of the project.
   - Permission system requirements analysis, design and development. Document redundancy and consistency checking mechanism algorithm. Design and development of background document management system.

- Middleware Restful interface development and documentation.Redis cache operations such as permissions and document attributes. MongoDB of the second-party package for the preservation of historical data.
- The Ativio search engine handles document searches. The TibcoJMS message notifies the business system of document attributes and permissions changes.
- Implement RBAC+ABAC hybrid permission model, supporting multi-dimensional authorization of users, roles, and departments.

3. Improvement of research and development efficiency

- Develop over 20 automated operation and maintenance scripts to automate deployment, monitoring, log analysis, and other scenarios, reducing operation and maintenance labor costs by 40%.
- Design an API document automatic generation tool that outputs interface documents based on the Swagger specification, improving team collaboration efficiency by 30%.
- Establish a performance optimization closed-loop mechanism, and improve system throughput by 50% through JVM tuning, SQL optimization, and other means.
- Establish a knowledge base, conduct regular reviews, and summarize issues.

Citi CRM Master Central(CMC) Jan. 2016 – Dec. 2016

Introduction: Citibank Global Customer Relationship Management System, information storage, sharing, authority control and data analysis of CRM in various departments.

Technology:Spring,Spring MVC,MyBatis,Oracle,Jersey,MongoDB,TibcoJMS etc.

Responsiblity:

1. Technological architecture evolution

- Responsible for designing and implementing backend service frameworks based on Spring, SpringMVC, and MyBatis.
- Successfully integrated Oracle database and MongoDB to support traditional structured data and non-traditional data processing needs.
- By introducing the Jersey framework to provide Restful API interfaces, the flexibility and accessibility of the system have been enhanced.
- Integrated TibcoJMS message notification mechanism, achieving real-time synchronization of public and private information changes between business systems.
- Utilize MongoDB to record historical data and change logs, achieving efficient tracking and retrieval of change logs.

2. Core system construction

- Provide Restful interface and documentation.Establish permission control for access to CMC system.
- TibcoJMS message notifies the change of public information and private information of the business system.
- Historical data recorded to MongoDB and data processing of unconventional schema structures.
- Statistics and analysis of CMC application data, tracking and acquisition of change logs.

3. Improvement of research and development efficiency

- Promoted internal technology sharing within the team, organized multiple technical seminars, and facilitated the dissemination of knowledge and the improvement of technical capabilities.
- Established a standardized code review process and developed a detailed code review checklist, significantly improving code quality.
- By introducing advanced development tools and methods such as Continuous Integration/Deployment (CI/CD), development efficiency and software delivery speed have been improved

Citi Rates Oct. 2015 – Jan. 2016

Introduction: Citibank Global G10 Currency Trading Core System, along with real-time stock analysis and securities investment trading.

Technology:Spring,Struts2,Hibernate,Oracle,Scobby,liborate.

Responsiblity:

1. Technological architecture evolution

- Participate in system architecture optimization, decouple front-end display and back-end logic, and improve code maintainability.
- Design a lightweight service layer based on Spring, replace some of the EJB components, and improve system deployment efficiency.
- Optimize the Oracle database access layer, reduce database pool configuration and SQL tuning.

2. Core system construction

- Identify and resolve memory leakage issues, such as JVM Full GC.
- Optimize thread competition in high concurrency scenarios and improve system throughput.
- Optimize core transaction logic, reduce lock contention, and shorten transaction processing time.
- Develop log analysis tools to automatically locate common error patterns and reduce troubleshooting time.

3. Improvement of research and development efficiency

- Introduce static code analysis tools to reduce the density of code defects Optimize core modules to reduce code complexity.
- Establish a code rollback mechanism to shorten the recovery time for production issues.

UniSysTech Consulting (China) LTD Hefei, China Oct. 2013 – Sep. 2015

Scotiabank Registration Jan. 2015 – Sep. 2016

Introduction: Provide Scotiabank employee qualification evaluation platform, realize the connection with the national NRD database system, and realize the talent qualification evaluation and storage.
Technology:Spring,Spring MVC,Mybatis,Activiti,MySQL,Spring Batch,Maven etc.
Responsiblity:
1. Technological architecture evolution

- Design a process engine based on SpringMVC+Activiti to support the automation of the entire employee qualification assessment process and improve process processing efficiency.
- Implement real-time integration between the system and NRD database, using asynchronous message queue and data verification mechanism to ensure data consistency.
- Build a batch processing framework based on SpringBatch and combine it with EOD job module to execute batch processing jobs.

2. Core system construction

- Develop an online application module to implement a multi-step qualification review process, supporting the upload and automatic verification of materials in PDF/Excel formats.
- Design a RBAC based permission model that supports multi-dimensional access control for departments, roles, and positions.
- Build a report analysis system, develop a qualification review tracking report module, support real-time status query and historical record tracing.
- Implement a data visualization dashboard that provides analysis of key indicators such as pass rate and processing efficiency.
- Implement the connection between external systems and NRD database, realizing core functions such as employee data synchronization, qualification status updates, and report generation.
- Design EOD assignments, report modules, qualification review tracking and display Develop a task monitoring interface that supports failed retries and exception alerts.

3. Improvement of research and development efficiency

- Optimize Maven build process, introduce modular design, and reduce build time.
- Develop automated testing tools that cover core business processes and improve test case pass rates.
- Establish a code review mechanism to reduce the density of code defects and minimize production issues.

Scotiabank Protection System(SPS) Oct. 2013 – Jan. 2015

Introduction: Scotiabank provides an insurance product sales platform for third-party insurance companies, supporting global sales of third-party insurance products.
Technology:Spring,eJSF,eSOA,DB2 etc.
Responsiblity:
1. Technological architecture evolution

- Based on the eSOA architecture, design distributed services to decouple core modules such as insurance companies, products, and customers, and improve system scalability.
- Develop a dynamic form engine that supports flexible configuration of over 100 insurance products, shortening the product launch cycle.
- Optimize the eJSF front-end framework to improve page loading speed.

2. Core system construction

- Responsible for the domestic branch module, achieving data synchronization between branches and headquarters, and supporting real-time updates of daily transaction records.
- Develop branch level sales reports that support multidimensional performance analysis.
- Design national/regional modules, connect with third-party insurance companies, and support unified management of insurance products.
- Implement dynamic configuration and real-time updates of product rates, terms, and other information.
- Build a customer module, develop a dynamic form engine, and support flexible collection of customer information and insurance requirements.
- Implement customer profiling function, support precision marketing and personalized recommendations.

3. Improvement of research and development efficiency
   - Develop an after-sales work order system to support problem tracking and handling, and improve customer satisfaction.
   - Establish a CI/CD pipeline to shorten the version release cycle Introduce code quality inspection tools to reduce the density of code defects.

Skills

- Solid knowledge in some popular programming languages. Specially in C/C++, Java.
- Strong C/C++ programming and debugging skills and related build tools such CMake, shell,connan etc.
- In-depth knowledge on DDS and ROS-like middleware, SOME/IP and AutoSar AP experience.
- Large-scale, high-performance, reliability-demanding communication system experience.
- Understand common development frameworks such as Spring, MyBatis, SpringMVC, SpringBoot, etc.
- Solid knowledge inter-thread communication and multi-thread programming.
- Have Redis, Kafka middleware development experience.
- Have experience in micro-service architecture design, project development and maintenance management.
- Have experience in Docker and k8s.
- Solid knowledge of design and development in embed environments such Autosar,QNX or embedded Linux.
- Has experience in hardware, including Journey 5, S32G, autotalks, nebulalink and Lauterbach etc.
- Good business English skills(written and spoken),native Chinese language skills.

READ ME

- Love life, love technology, pay attention to the accumulation of professional knowledge.
- Creator who is willing to share, cheerful and has a good team atmosphere.
- Positive work attitude, focused attention and responsibility.
- Experienced software engineer who constantly seeks out innovative solutions to everyday problems.
- Have honed my analytical thinking and collaboration skills, and love working teams.

Education

Anhui Sanlian University, Anhui, China Sep. 2010 – Jun. 2014

Bachelor in computer science and technology

Miscellaneous

- GitHub: https://github.com/pengfeinie
- Home: https://pengfeinie.github.io/
- Blog: https://blog.csdn.net/pfnie