CantorAI Distributed Computing Platform

Build, deploy, and manage large-scale AI applications, Simpler and Faster, with potent edges and seamless collaboration between devices and the cloud.

Galaxy AI App Builder

0-Code App Development

1-clk Dist. Deployment

Auto Elastic Scaling

Integrated AI Alg. & Models

Cantor Computing Framework

Heterogeneous devices and OS Support

Deeply optimized utilization of computational resources

Collaboration between edge computing and edge-cloud

Programs run with minimal memory footprint

XLangTM programming language

Faster execution than Python

Lower resource consumption

Increased GPU utilization

Support for low-end IoT devices

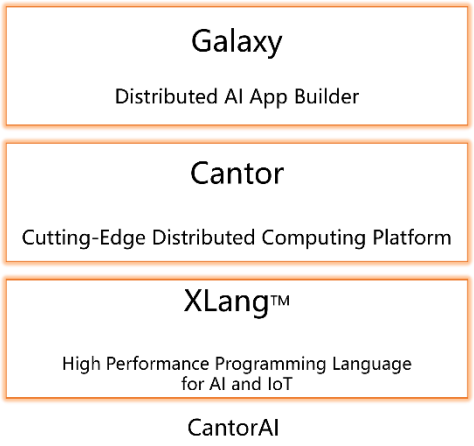
Open source under the Apache License

Deployment scenarios

Vision

LLM （Coming Soon）

Big Data（Coming Soon）



- **Simplify distributed AI applications from development, deployment to service.**
- **Improve device efficiency from GPUs, edge servers to the cloud.**
- **Support and collaborate with various devices and operating systems, from microcontrollers, Raspberry Pi, smartphones to Windows, Linux, and MacOS.**
- **Establish a solid foundation for open-source and open programming languages, algorithms, and AI models.**
- **CantorAI is your best choice for cost, performance, system expansion, and time-to-market considerations.**

CantorAI is a user-friendly, high-performance, and scalable distributed computing platform with seamless edge, front-end and cloud integration, accelerating AI application development, simplifying distributed deployment, and optimizing AI workloads.

Simplification: CantorAI supports non-coding extension from low-end IoT devices (e.g., MCU8) to the cloud. The platform deployment is independent of third-party software, occupying minimal memory. Additionally, it offers zero-code AI application building, enabling collaborative work across front-end, edge, and cloud.

High Performance: CantorAI features deep computational resource optimization, significantly boosting execution speed compared to Python. GPU efficiency has tripled, enhancing efficiency in zero-code application generation, distribution, and system expansion for development, deployment, and operations.

Openness: CantorAI adopts the XLang open-source programming language, allowing integration of third-party algorithms and models for greater flexibility and scalability. The platform already provides enterprise-level

The outstanding performance of the CantorAI platform comes from its unique architectural design and streamlined implementation. This makes edge computing servers more powerful, enabling efficient collaboration with the cloud, terminals, and other edge nodes.

CantorAI is designed to provide powerful tools for AI developers to discover and unleash the performance of computational resources, making it easier and more efficient to build, deploy, and manage various artificial intelligence applications.

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Galaxy – AI APP Builder

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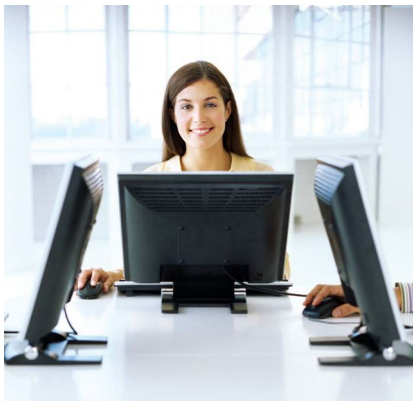


The development of a scalable distributed AI system deployment requires advanced AI experts, AI models, and a significant amount of time for development and trial and error. The deployment of AI applications, especially distributed AI applications, involves multiple operating systems, versions, and front-end devices, making the work extremely complex. When requirements change and the system needs adjustment or expansion, the existing deployment solution may need to be completely overhauled.

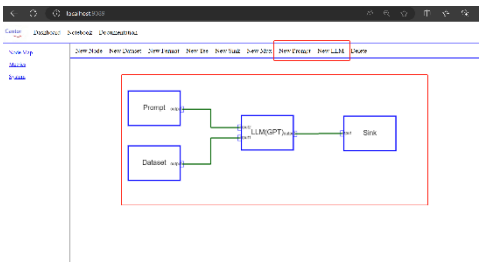
The Galaxy AI App Generator allows developers to build AI applications with zero code through a concise, visual 'filter' pipeline design. Developers can drag and drop third-party enterprise-level AI algorithms and models into the AI application.

Based on the services provided by the Cantor distributed computing platform, which abstracts AI applications as 'filter pipelines' and configurations for different distributed systems, the Galaxy AI Application Generator will automatically generate and complete optimized deployment solutions. When changing requirements lead to changes in system resources, such as when a system that originally had 10 nodes needs to expand to 1000 nodes, the Galaxy Application Generator can, based on the original filter pipeline, generate and deploy new solutions with zero code.

Galaxy “Filter” Pipeline

- Zero-code generation, debugging, and monitoring of AI applications
- Distributed pipelines, one-click application deployment, and automatic system elastic scaling
- Drag-and-drop 'filters,' embedding enterprise-level AI models and algs
- 'Filter' marketplace, open integration of third-party AI models and algorithms

Code parsing and visualization



Galaxy “filter” models/Algorithms

1. Identity and Feature Recognition:

- Face recognition - Person profiling
- Pose recognition
- Facial Expression recognition

2. Object and Scene Analysis:

- Object recognition - Scene reconstruction
- OCR - Depth estimation

3. Motion and Behavior Analysis:

- Trajectory tracking
- Anomalous behavior recognition
- Group behavior recognition

4. Image Processing and Enhancement:

- Image enhancement and restoration
- Image Style transformation

5. Industry-specific Applications:

- Defect detection - Quality control
- Medical imaging analysis
- Agricultural monitoring - Traffic monitoring
- Environmental monitoring
- Visual heart rate acquisition
- Visual shelf monitoring
- Patient anomaly alert

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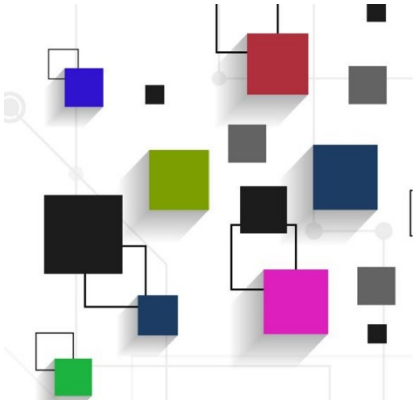
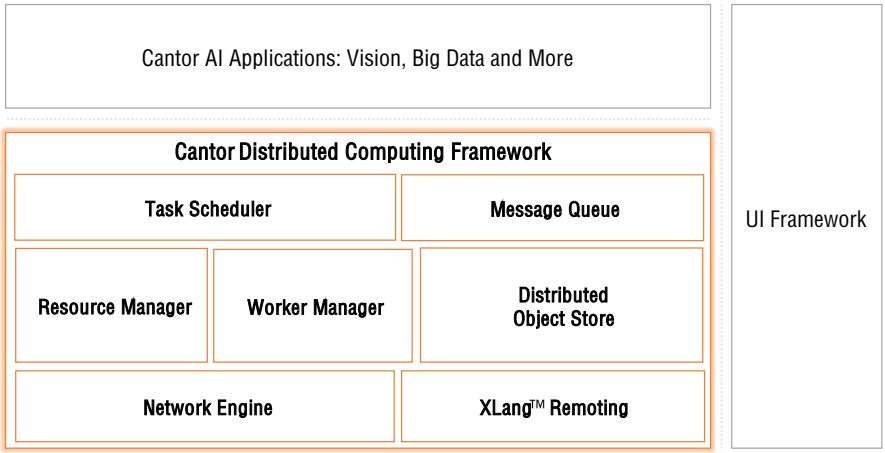
Cantor Edge-Cloud-Device Collaborative Distributed Computing Framework



Compared to other distributed computing frameworks, Cantor not only further simplifies the construction, deployment, and scaling of large-scale distributed AI systems for machine learning, data analysis engineers, and developers but also optimizes and enhances distributed computing performance. It increases compatibility with heterogeneous devices, systems, and networks.

Cantor supports operating systems such as Android, iOS, Linux, Windows, and macOS, providing unified support for IoT and other low-end computing devices, as well as heterogeneous networks. Cantor relies minimally on third-party software, has very low memory usage, and can be uniformly deployed across different devices, efficiently collaborating between cloud, edge nodes, and front-end devices.

Built on a unified and high-performance framework, Cantor employs unique strategies for task scheduling and efficient algorithms to deeply optimize the application of distributed computing resources. This further enhances the efficiency and performance of the system.



Cantor 分布式框架的简化架构

- Network Manager manages heterogeneous networks
- Worker Managermanages processes and threads.
- Task Scheduler and Message Queue optimize resource utilization deeply.
- Resource Manager uniformly manages heterogenous resources.
- Minimum 1MB memory footprint, supports unified deployment, and is compatible with low-end computing devices.

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Xlang™ Programming Language

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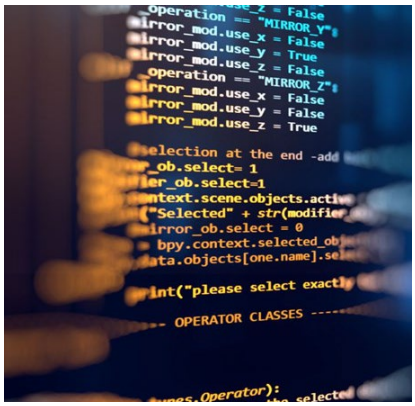

XLang is a new programming language that combines the simplicity and expressiveness of dynamic languages like Python with the speed and efficiency of compiled languages like C++.

XLang inherently possesses distributed computing capabilities, making it easy to scale for large-scale data processing and machine learning tasks across multiple nodes.

Designed for artificial intelligence and the Internet of Things, XLang comes with built-in support for features such as arrays, matrices, tensors, graphs, neural networks, data frames, streams, files, databases, web services, sockets, protocols, encryption, compression, serialization, and more. With rich libraries and frameworks, XLang offers performance several times that of the Python language, ensuring high performance for CantorAI applications.

XLang is an open-source programming language, created, maintained, and promoted by the XLang Foundation supported by CantorAI.

Dynamic Typing: XLang is a dynamically typed language, meaning the variable types are determined at runtime rather than compile time. This makes code writing more concise and flexible, and it also facilitates advanced features such as metaprogramming and reflection.

High Performance: XLang employs advanced Just-In-Time (JIT) compilation technology to convert source code into efficient machine code for execution at runtime. According to benchmark tests, XLang runs faster than Python while maintaining the flexibility of a dynamically typed language.

Distributed Computing: XLang comes with native distributed computing capabilities, allowing easy parallel execution of tasks across multiple nodes with data sharing and communication. XLang supports various distributed computing models such as MapReduce, Spark, and Dask, and provides a rich set of built-in function libraries for handling large-scale data.

Seamless Integration: XLang is a 'super glue' language that seamlessly integrates with other languages such as C++/C, Python, JavaScript, and any framework across operating systems. XLang provides a simple yet powerful Foreign Function Interface (FFI) that allows direct invocation of functions or libraries from other languages, automatically handling details like type conversion and memory management. This makes XLang a super glue that bridges different ecosystems and platforms.

Ease of Use: XLang features a concise and elegant syntax, drawing inspiration and incorporating design philosophies from popular languages like Python and JavaScript. Its Integrated Development Environment (IDE) supports features such as code completion, debugging, and testing, and provides a Markdown-based notebook system for users to write and share code conveniently.

Use Cases

- Build deep learning models in XLang using TensorFlow or PyTorch with minimal code changes.
- Perform distributed data analysis in XLang using Spark or Dask with advanced abstractions.
- Create web applications in XLang using familiar frameworks such as Flask or Django.
- Communicate with IoT devices in XLang using standard protocols like MQTT or CoAP.
- Call functions or methods from languages like C++, C#, Java, Python, and JavaScript directly from XLang code, without any wrapping or binding. Pass objects or data structures between these languages without any conversion or copying.

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Deployment Scenario: VisionSolutions

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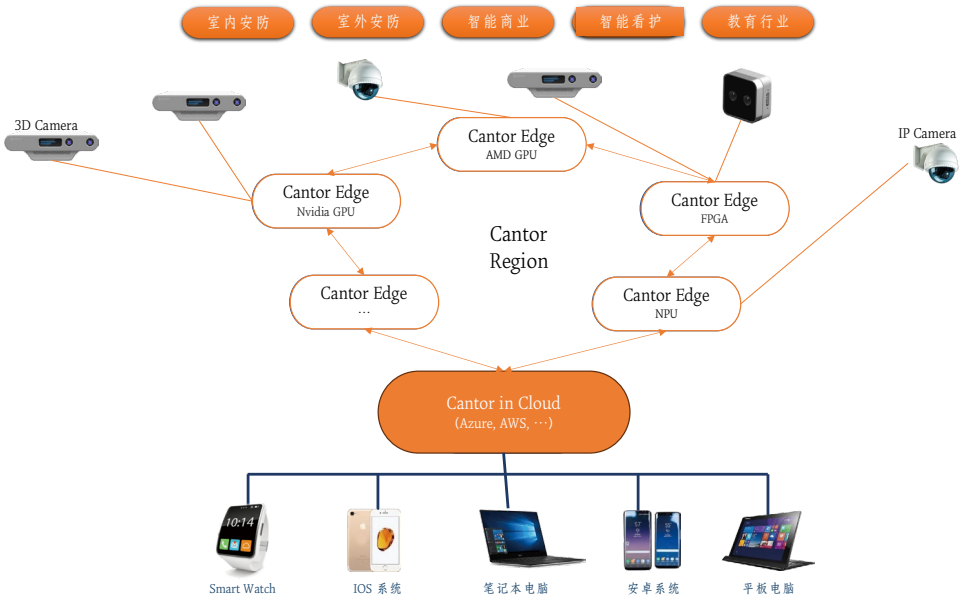

Indoor Intelligent Security System: Restricted Individual/Crowd Behavior Recognition and Warning System: By acquiring spatial information, accurately determining the distance and changes between individuals, as well as between individuals and objects, it can precisely identify human behavior unaffected by environmental lighting. Through non-contact respiration and heartbeat detection, it accurately assesses changes in the target's emotions. Applicable in interrogation rooms, prisons/detention centers, homes for the elderly, ICU wards, nursing homes, mental hospitals, and other locations.

Outdoor Intelligent Security System: A high-precision proactive security system that combines 3D behavior recognition technology with GIS technology. Each set of monitoring devices accurately identifies individuals and vehicles entering its surveillance area, providing proactive warnings or alarms based on behavior analysis and prediction. The control center can remotely view the scene based on the warning or alarm information from these devices. Using the GIS coordinates provided by the devices, it can promptly deploy the nearest personnel to prevent or intervene in criminal activities. Applicable in locations such as airports, train stations, bus stations, ports, important intersections, and schools.

"Education Industry - Teacher and Student Behavior Recognition and Warning System: Proactive warning of abnormal behaviors of teachers and students: Detection and alarm for significant movements resulting in students' noticeable displacement, falls, or being on the ground, as well as loud crying by children and teachers loudly scolding or reprimanding. The system records changes in children's heart rates, outputting semantic data points for abnormal behaviors. Applicable in places such as kindergartens, primary and secondary schools, and training schools

Business Intelligence - 3D Face Capture/Behavior Recognition/Trajectory Tracking and People Counting System: Using high-precision facial recognition algorithms, it can track and identify any number of individuals with 100% accuracy in any complex environment. Records the entry and exit times of each customer in the monitored area, reproduces the customer's movement trajectory, and helps businesses analyze changes in customer flow and customer behavior patterns. Applicable in large shopping malls, supermarkets, office buildings, parking lots, hotels, tourist attractions, and other locations.

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