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Lenovo and Intel AI solution for queue and crowd analytics

WaitTime's patented AI powers an intuitive guest interface and operator's platform to observe, measure, and maximize delivery for customer spaces using both real-time data and historical analysis.



Challenge

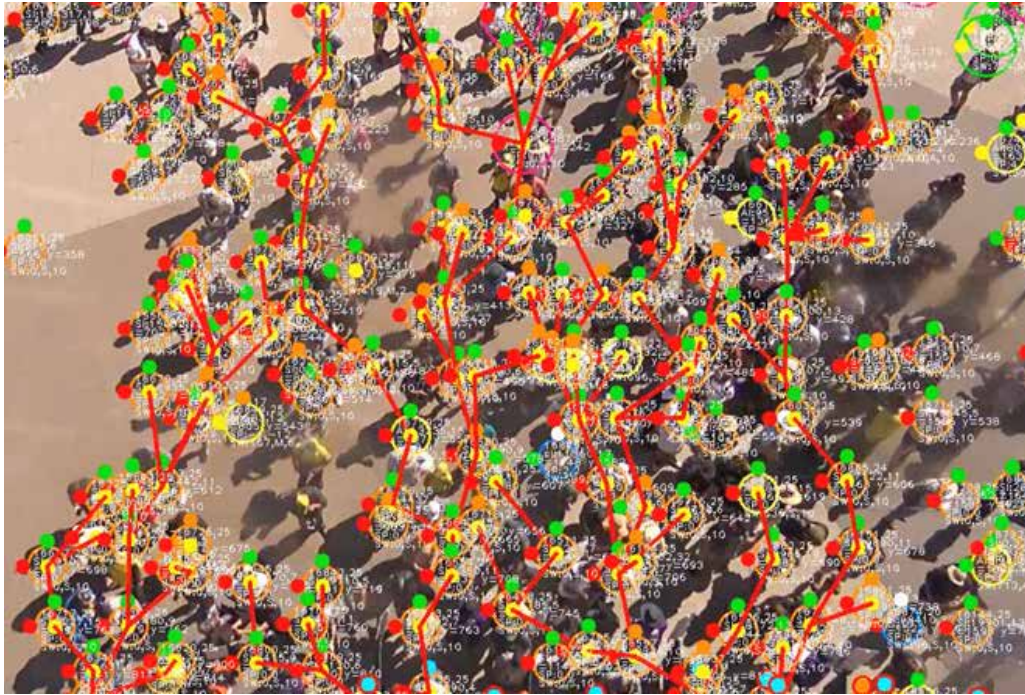
The key to making the most out of your spaces is distribution – your customer space is often overloaded in one area and under loaded in another due to foot traffic, schedules, line-ups, or even guest preference. It's hard to identify and solve distribution issues without being able to see where people are - you can't track or improve what you can't measure. This impedes practical communication with customers, leading to lost business opportunities and diminished customer experience.



Solution

WaitTime is a patented, real-time and historical artificial intelligence software that uses state-of-the-art imaging techniques to monitor and engage with crowds. The software provides technology solutions that monitor the number of people within a space, communicate with guests to regulate the amount of traffic, and share crowd traffic information to promote best practices. All of this leads to healthier, safer, more efficient spaces.

- **Real-time way-finding on digital displays** and mobile to help guests find the shortest lines and least busy spaces resulting in more **evenly distributed crowds**
- Make real-time smart decisions leveraging the operations dashboard to enable **better guest services, security, and business intelligence**
- Historical data provides documentation on crowd conditions resulting in **improved services, better business practices, and safer spaces**



WaitTime artificial intelligence software in action







WaitTime use cases:

- [NEC - Exhibition Centers / Convention Centers](#)
- [Mall of America - Shopping Malls / Retail](#)
- [Denver Broncos - NFL / Stadium / Gate Entrances](#)

Lenovo and Intel partnered with WaitTime to offer a solution to observe, measure, and maximize customer spaces. Cameras are mounted over the designated space and uses a variety of proprietary algorithms to determine overall occupancy and capacity. That data is shared in real time with operators, through a customizable dashboard, as well as on flexible crowd intelligent guest engagement platforms that share wayfinding with guests on digital displays and venue mobile applications. By sharing real-time crowd occupancy information with guests, venues can communicate and manage densities as people enter, navigate, and exit the facility, informing business intelligence, safety, and design practices.

WaitTime software provides a variety of customizable crowd-management solution for unique spaces. Additional tools include real-time occupancy alerts at designated capacities to staff members, security and cleaning resource allocation based on crowd densities, occupancy control communication on guest facing platforms, and flexible communication tools that allow for quickly changing environments.

Benefits

-  Observe crowd conditions through the WaitTime operations dashboard to manage crowds in real time
-  Manage social distancing by setting area-based capacities
-  Deploy services (security, cleaning, guest services, operations) based on real-time crowd loading and alerts
-  Help guests make smart decisions when moving through the space by using digital displays, mobile app integrations, and other crowd-intelligent way-finding platforms
-  Reference historical data reports to inform management on operational strategies, scheduling, staff loading, security, and more
-  Tie WaitTime data into existing digital infrastructure to have automated, crowd intelligent platforms (for example, send mobile concession orders to the stands with the least busy lines)

Validated Architecture

All hardware lives on site, included Lenovo servers powered by Intel processors and WaitTime cameras, monitors, and computer equipment. Through video feeds from the cameras, WaitTime AI software processes people counts, capacities and occupancy. Cameras can be existing or new because the solution is camera agnostic. Existing cameras must support 1080p, RTSP and can't be PTZ. Additionally, WaitTime developers will modify low level coding to address specific objectives including: ingress/egress counting, interior congestion areas, smart wayfinding and queue monitoring.

The solution uses one camera per monitored area. RTSP feeds are processed locally on a server (typically 30 cameras per server with 1 redundant server). RTSP feeds from cameras are processed by on site servers. Dashboard, app, and digital displays are available via HTML.

Design Components

	Servers	Storage	Networking	CPU	Software
Edge	Lenovo ThinkEdge SE450	1.4 TB	10/25GbE SFP28	Intel 32 Core Gold CPU 256GB RAM	Microsoft Server OS GUI WaitTime Server Software WaitTime Dashboard Software
1U Rack	Lenovo ThinkSystem SR630	1.2TB	10/25GbE SFP28	2x Intel 32 Core Gold CPU 512GB RAM	Microsoft Server OS GUI WaitTime Server Software WaitTime Dashboard Software

Resources

- [Explore the Lenovo EMEA HPC and AI Innovation and Briefing Center](#)
- [Lenovo ThinkEdge SE450](#)
- [Lenovo ThinkSystem SR630 V2](#)
- [Lenovo Validated Design for AI Infrastructure on ThinkSystem Servers](#)
- [WaitTimes](#)
- [WaitTimes on YouTube](#)

Why Lenovo

Lenovo Ai-ready infrastructure and expertise span the data center to the cloud, client, and edge. Lenovo partners with industry leaders like Intel to ensure the best possible performance for AI in the field or data center. Lenovo offers proven, ready-to-deploy infrastructure solutions optimized for industry-leading independent software vendors (ISVs) and designed for any size or scale. With worldwide Lenovo AI Centers of Innovation and Excellence, Lenovo extends Ai expertise to our partners and customers. Lastly, Lenovo supports the most significant AI software vendors through the Lenovo AI Innovators program, ensuring the best AI software runs seamlessly on Lenovo infrastructure. To find out more visit www.lenovo.com.

Intel® Xeon® Scalable Processor

With consistent, predictable performance, Intel® Xeon® Scalable processors give you fast, reliable processing across each of your AI environments. Intel's continued innovation brings to the cloud new integrated features, such as Intel® Deep Learning Boost (Intel® DL Boost) to accelerate performance for artificial intelligence workloads and reduce the need for custom accelerators like GPUs.

For More Information

To learn more about this solution, contact your Lenovo Business Partner.



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