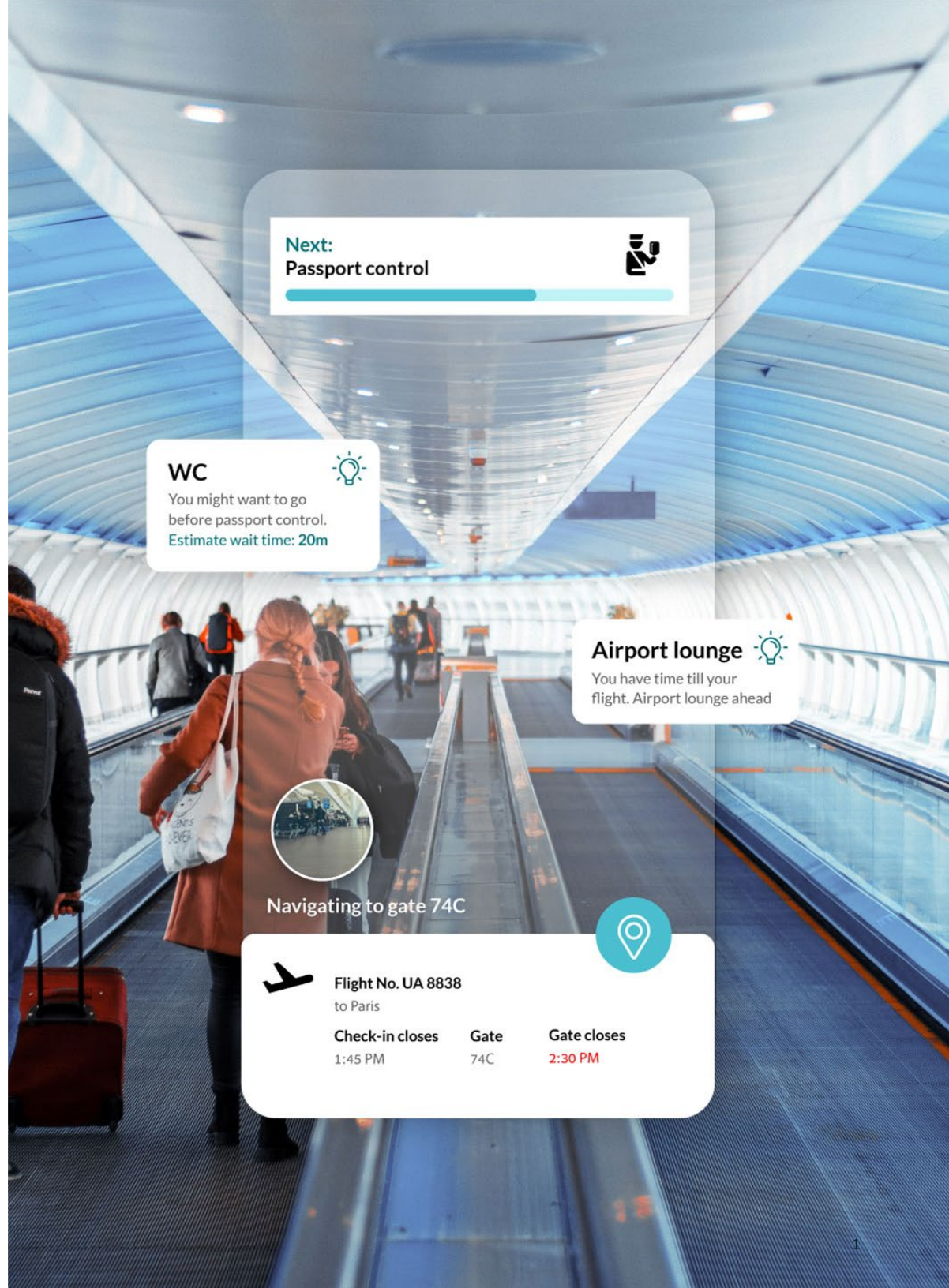




Vera AI & AR Platform for Commercial Spaces

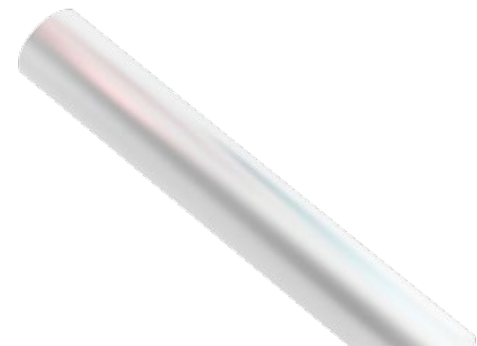
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Resonai.com



Introduction

As the transformation of our physical and digital worlds continue to converge, we see an explosion of IoT devices, an increased use of robotics, autonomous vehicles and the corresponding growth of software and applications. But many of these devices and applications are growing in silos and don't speak in a unified language limiting the ability to communicate with each other and their overall usability. In order to realize a new world of spatial computing, one that can solve critical business problems and is ready for mass consumer adoption, a new, unifying, much more intelligent platform is needed.

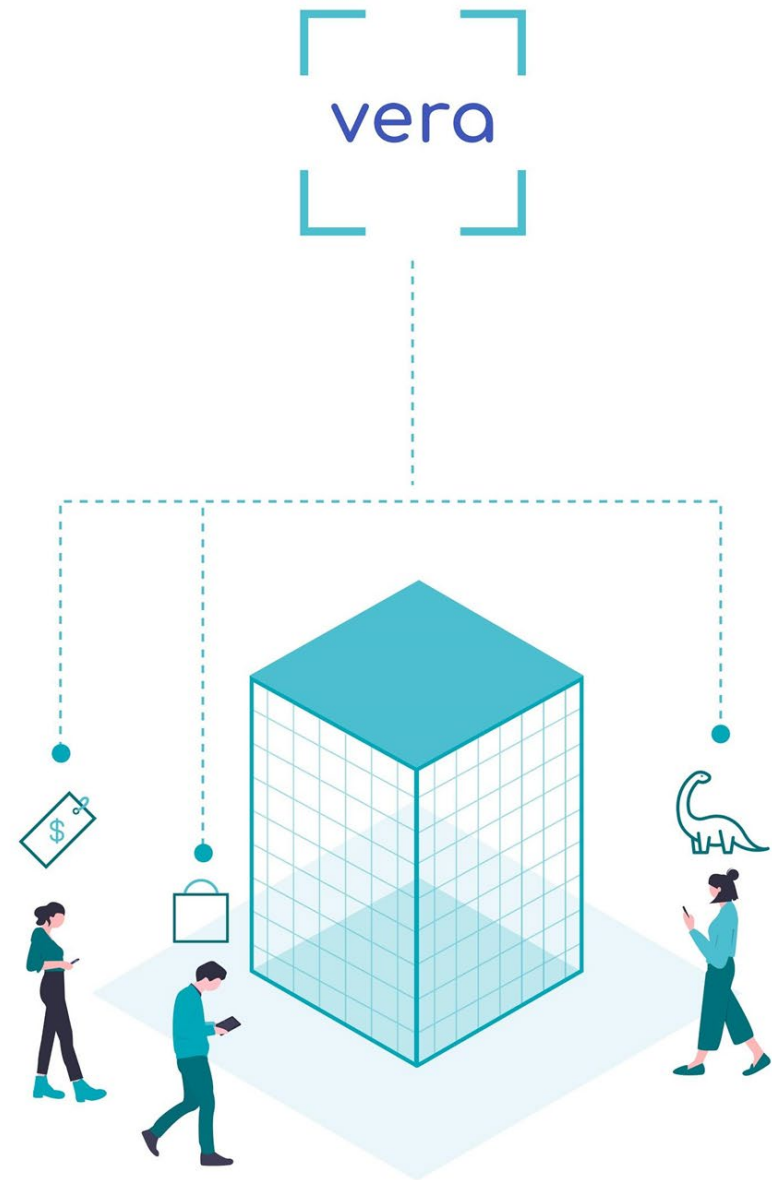
Resonai is introducing a paradigm shift in spatial computing by solving some of the most critical challenges in computer vision and spatial embedded AI in order to transform any physical environment into an intelligent digital space. We embed intelligence directly into a building so that any device (robot, IoT device, sensing device or autonomous vehicle...) or application, can communicate with each other, share data and operate with much higher intelligence. In this intelligent digital environment, all agents are now context aware, can synchronize across platforms and communicate across protocols to become much more useful.



New possibilities

We believe that the entire physical structure of any building, store, hospital or commercial space, provides a canvas for the next digital revolution, creating much more efficient facilities, with new digital experiences and even new revenue models within them.

To help move this vision forward, we've introduced Vera™, a new kind of platform that imbeds intelligence into any facility, providing access to these new digital possibilities.



Vera™ Platform for Commercial Spaces

Vera™ is an AI and AR platform that uses a complete and precise understanding of a building's 3D structure as the foundation for a new class of applications that addresses the entire building life cycle.



Create apps for full-3D spaces

Vera™ applications are unlike anything that was previously possible with a highly accurate understanding of the unique structure and geometry of a physical space. Applications are more immersive, natural, and useful by an order of magnitude than the single-surface applications possible with platforms like ARCore and ARKit.



A complete platform

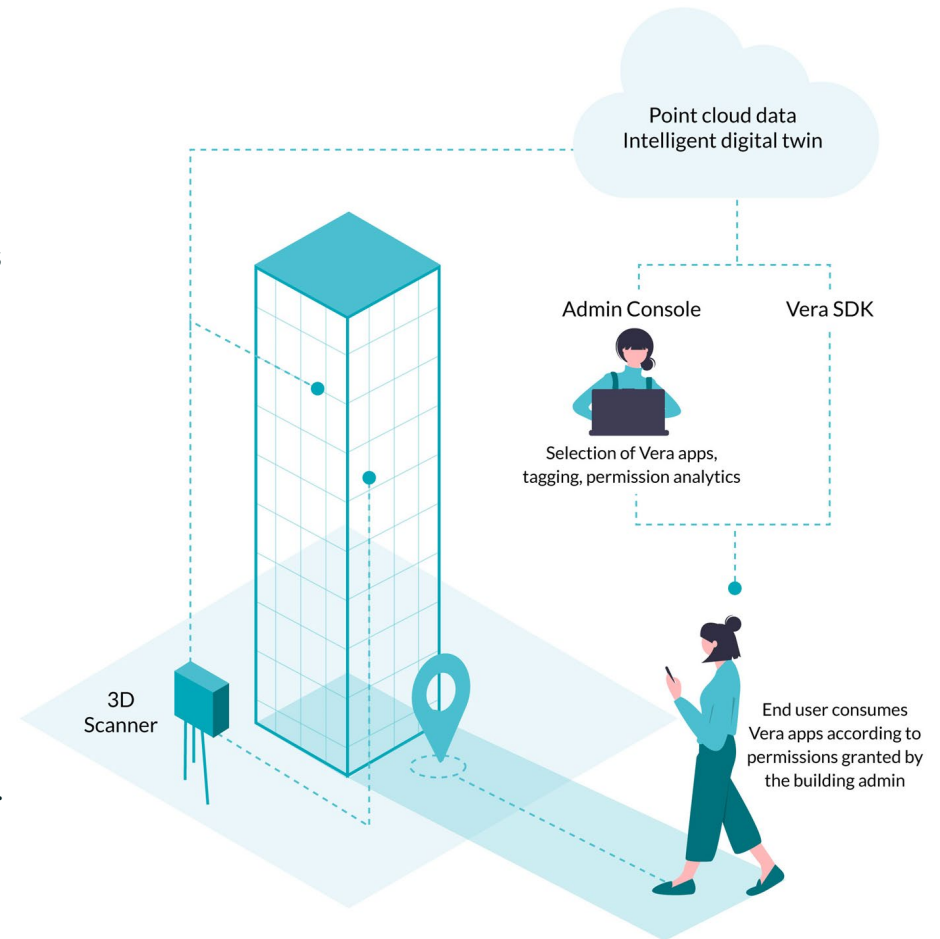
Vera™ is a fully productized platform that provides shared core features across multiple existing applications, an administrative console & tools for remote management across multiple locations and an SDK to enable development of new applications for infinite possibilities.

Creating an intelligent digital twin

Vera™ starts with a detailed, high-quality 3D scan of any space, created with a professional LIDAR scanners or 3D cameras.

The data is uploaded to our cloud servers and processed in the Vera™ pipeline to create the Intelligent Digital Twin. Vera™ analyzes the entire structure of the building, with advanced 3D reconstruction, object classification and object recognition technologies. This deep understanding of the environment, coupled with very precise localization and positional tracking of end users, allow applications to take full advantage of the true structure and geometry of a space. Applications feel more immersive with realistic physics and occlusion between virtual and physical objects.

Vera™ can process and support any size of 3D scan, to scale apps from the smallest to the largest facility. Once a master 3D scan is made, building operators can easily update the scan to support changes in the space, ensuring there is always an accurate 3D model. When building scans don't already exist, Resonai offers scanning services through a trusted network of third-party professionals.





Admin tools

Vera™ can be managed remotely via a built in administrative console that makes it easy to preview and simulate applications without being on site. Admins can manage multiple applications, across multiple locations simultaneously, providing a complete view and ongoing insights for optimization.

The administrative console provides a true 3D representation of the entire building in high resolution. This includes all devices, systems and equipment with a dashboard to manage it all from one place. A building admin can enhance the 3D model at any time by integrating additional information from different sensors, user information, and new devices, ensuring it remains updated and accurate.



Security

Vera™ uses role-based access control (RBAC) for user authentication and authorization. Each user has a role in the system, and each role has different access permissions. This allows building administrators to manage access. For example, a technician who works on the 5th floor may only need limited 5th floor access & data, while a property manager, may need access to the entire building.

Access control can be defined at the location level (i.e. users actual physical location in the facility) and the application level (i.e. not every person in a given location needs to be exposed to the same content), making it easy to define different levels of access for building tenants, visitors or maintenance staff.



Analytics

Vera™ collects useful analytics while respecting and maintaining user privacy. This data can include traffic patterns to identify hotspots or underutilized areas in a building; app usage information to help understand ROI of specific applications; user behaviour data to inform on interactions with devices, equipment, objects in a building; and much more.



Vera™ SDK

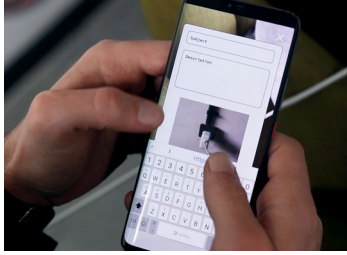
The Vera™ SDK harnesses our expertise in advanced semantics – powered by 3D object recognition, 3D scene reconstruction, and precise mesh understanding.

Vera™ is relevant for facilities in any industry and today is being used in CRE, retail, healthcare, and entertainment, with customers deploying Vera™ applications to other improve building efficiencies, create engaging consumer experiences manage IoT devices and access controls, and even to help identify new revenue opportunities from the new digital real estate that is created.

Vera™ applications run on any IOS or Android mobile device to leverage existing hardware and easily scale across locations and users.

Popular Vera™ applications include:

- Vera™ Smart Ticketing & Navigation
- Vera™ AR Training & Tutorials
- Vera™ IoT Controller
- Vera™ Visual Merchandising for Retail
- Vera™ Brand Experiences



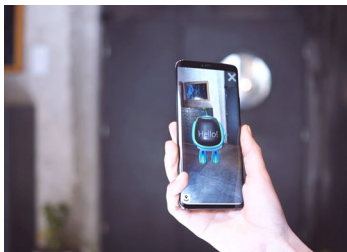
AR visualization & contextual sharing

Sharing essential information about design discrepancies, inspections, maintenance & repairs history between large remote teams, can now be simple. Vera™ offers a comprehensive view of these issues and other relevant data in a centralized 3D model, so operators can exchange comments and track progress with contractors and crew members from anywhere. Vera™ automatically records the location of the item and provides indoor AR navigation instructions to the exact location. Vera™ can integrate with existing systems to automatically retrieve and augment maintenance history and relevant information



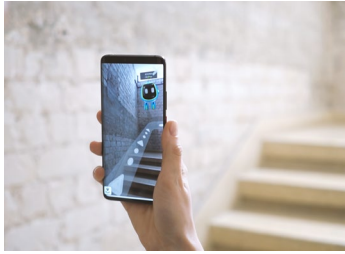
IoT control

With 3D object recognition, Vera™ lets you simply point your smartphone at connected devices to control them more naturally. You don't need to launch one app for lights and another for your thermostat. Vera™ recognizes the object, brings up the correct interface to automatically manage and control.



Indoor navigation

Vera™ includes precise localization and tracking without the use of any markers, to provide indoor navigation guides to any place in a building, while offering relevant content along the route, such as pointing out objects, equipment, places, bringing up equipment tutorials when necessary, etc.



Digital concierge

Vera™ Digital Concierge can help minimize physical contact with reception and concierge staff. To direct visitors with AR navigation, provide useful and contextually relevant tips about your facility's services based on where someone is, as well as special events or offers they can take advantage of during their stay.

The digital concierge guides people in commercial and retail spaces, helping them find shops of interest, and products of interest. It can be easily customized to offer personalized shopping experiences with customized navigation routes and targeted product promotions.

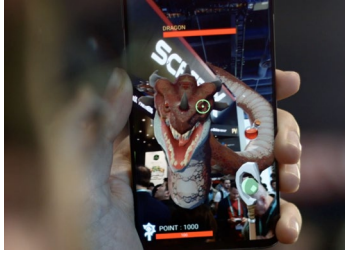
 [Watch video](#)



AR tutorials

Whether it's a hotel or a co-working space, it's common to come across equipment or processes that aren't intuitive to use. Rather than distribute complex documentation that goes unread and is quickly outdated, building operators can offer AR-powered tutorials. These can display step-by-step instructions, real-world tips, and other practical information for just about any kind of object, like common appliances or office equipment. Paired with Vera's navigation capabilities, you can even direct people to the right cabinet for the coffee mugs. AR Tutorials can be updated remotely via the Admin Console.

 [Watch video](#)



Gamified applications

With Vera™ you can also create AR experiences for engagement, entertainment and promotions, such as gamified experiences in buildings to encourage specific behavior, AR experiences that keep consumers longer in entertainment venues unique brand promotions in retail stores, digital experiences to provide more engaging concert experiences and much more.

 [Watch video](#)

The Vera™ SDK: A Development Platform Like No Other

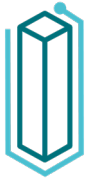
Working with large 3D meshes

Vera™ makes it easy to build, test, and deploy applications using large, detailed, and complete 3D meshes of your building. They are processed, indexed, and stored on the cloud so you can work with detailed models from anywhere, and they are optimized so you can quickly navigate and inspect the properties of the full scan.

Vera™ has the added flexibility to let you plug and play various components to enhance your application, like statistics about a building, registration information, and semantic tagging. The data model makes it really easy to add properties and store more information and calculations for future use.

When you want to test your applications, you can simulate them in multiple spaces, and see exactly how they work in a 3D space. Because of our web-based console, you can do this from anywhere – whether it's a building that's just down the road, or halfway around the world.





Semantics: adapting to spaces

Vera™ provides the intelligence that enables apps to adapt to any space. On the development side, no specific coordinates need to be hard-coded into an application. Developers can query specific items and their locations and the application will use this data in runtime to adapt to any given building.

Advanced Semantics understanding is at Vera's core. For instance, an application may be developed based on the presence of chairs, conference tables, stairwells, elevators, and connected devices like smart lights and thermostats. If the application is then used in a different facility that doesn't have one of those objects, or if there's a notable change to one of those objects, the application will adapt accordingly. In other words, a single application provides tailored experiences based on what is present at any given time in the specific space.

Vera™ offers a hybrid approach for semantic understanding of all objects through a combination of automatically detecting objects from the 3D scan, combined with the ability of the building admin to review, verify, and manually tag additional objects.



A "SLAM" dunk for AR apps

Vera™ overcomes the traditional challenges commonly associated with registration and tracking, by using a high-quality 3D scan of the space. Vera™ can index and pre-calculate with high accuracy, everything that's needed to solve the SLAM problem, and is working on integrating a global coordinate system that allows developers to optimize applications around knowing where a user is within a building, as well as what direction they're facing.



Plugin for Unity

We have created a plugin to help Unity developers build Vera™ applications. Our Unity plugin will do the compiling, facilitates working with large 3D meshes efficiently, applying semantics, loading applications, and provides the hooks for an applications start and end. Developers can leverage all the powerful capabilities in the Vera platform without having to learn a new environment.



A new frontier

Vera™ is a new kind of platform that makes it possible to transform any physical space into a much more intelligent environment . With this imbedded intelligence an endless possibility of new applications and experiences are possible to create efficiencies, provide new end user experiences and to create new digital revenue streams that one day may surpass physical building revenue.

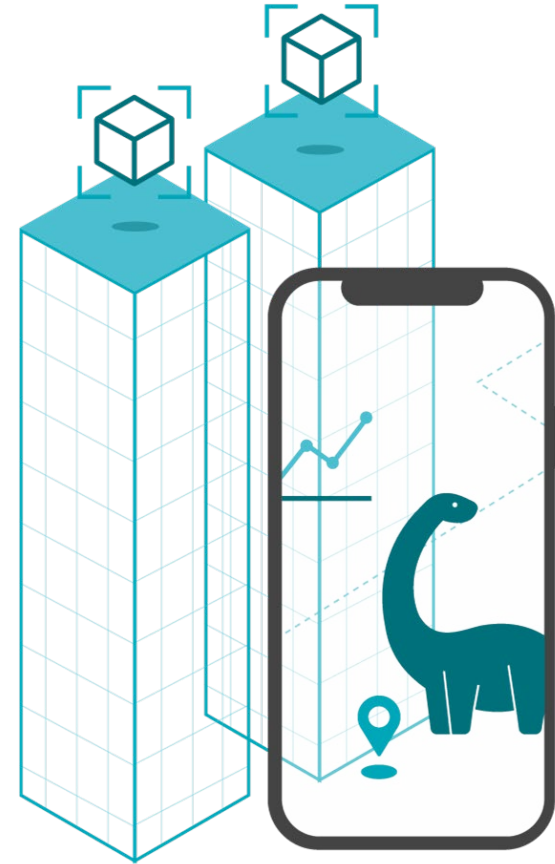
Let's Build Something Together

If you're interested in piloting Vera™ within a building, store or any type of commercial space or if you want to develop applications with Vera™, send us a note at Vera@Resonai.com.

About Resonai

Resonai is solving some of the most critical challenges in computer vision and spatial embedded AI to transform physical environments into intelligent digital canvases, enabling applications and devices to communicate and synchronize data to operate more intelligently.

Vera™ is Resonai's AI/AR platform that transforms any building into an intelligent digital space. With Vera™, physical spaces are scanned once and sent to the AR cloud, where a very accurate intelligent digital twin is created, and its entire structure is analyzed. Now anyone can access Vera applications on mobile devices, with very accurate 3D semantic understanding and high precision navigation & tracking without the use of any markers.



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