
Unity®
Unity Technologies
2023

We believe the world is a better place with more creators.

190+
Countries and territories have Unity creators

72%
Of the top 1,000 mobile games were made with Unity

50%+
Of games across mobile, PC and console were made with Unity

20+
Different platforms run Unity creations

5 billion
Downloads per month of apps built with Unity

3.9 billion
Monthly active users who consumed content created or operated with Unity solutions

From game engine...

zynga · KABAM · glu · EA · Owlchemy Labs · HIBERNUM · UBISOFT · nWay · FRIMA · baobab · NEXT GAMES · COLOSSAL ORDER

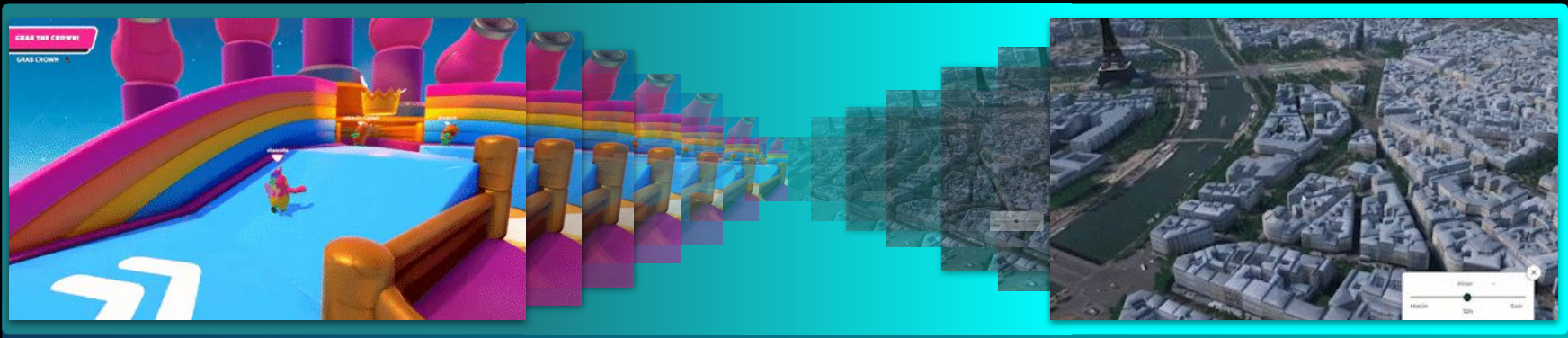
...to industry-wide innovation

Automotive	Architecture, Engineering, Construction	Aerospace, Defense	Natural Resources
VW · TOYOTA · BMW · Ford · DENSO · Audi · DAIMLER · BOSCH · Volvo · GM	AECOM · ATKINS · TAKENAKA · MWH · Trimble	LOCKHEED MARTIN · THALES · NORTHROP GRUMMAN · AIRBUS · BOEING	ENBRIDGE · ExxonMobil · Newmont · Chevron · Teck

From Real-Time 3D to Digital Twins

FROM GAMES

TO DIGITAL TWINS



Multiplayer	Multi-user collaboration
Mobile/XR games	Interactive 3D on any platform
Game simulation	Simulate real world
Game operation	Real-time insights

Credit: Fall Guys & BNP Paribas

Unity

Unity is the world's leading platform for creating & operating interactive, real-time 3D content.

Real Time Revolution

2D	PC/Mobile	Individual	Static
RT3D	**Multi-platform**	**Collaborative**	**Interactive**
			

Challenges

Data
Outdated, not centralized, hard to interpret, time consuming to collate

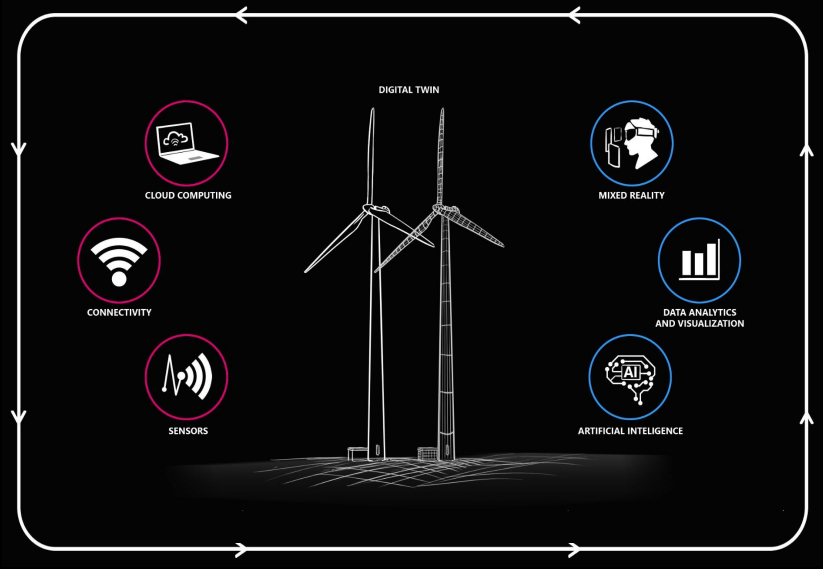
People
"Best-guess" decision making, too much data to monitor simultaneously, tribal knowledge exiting with aging workforce

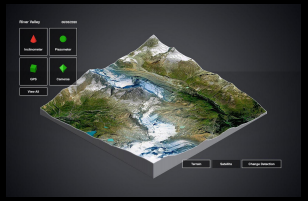
Tools
Formats lack context and details can be missed, notifications received too late, paper processes, redundant tools

Processes
React to issues, downtime due to unplanned maintenance, high maintenance costs

Digital Twin Definition

A **digital twin** is a real-time digital replica of a physical device or entity, living or non-living.





Digital representation

Digitally represent real world scenarios while simulating any aspect of assets, environments, people, processes and technologies.

Automation & Simulation

Provide comprehensive benefits including automation and simulation of any possibilities.

Right-time data

Connect real-time and right-time data to drive decision-making.

Why Unity Digital Twins

generate and create data driven business outcomes

Unity does three things like no one else:

Unlock siloed data

We unlock 3D data (and associated metadata) from its proprietary silo into a single optimized DT view. - i.e. CAD data, Autodesk BIM, IOT from Azure, GIS from ESRI, 360 photogrammetry, Lidar etc.

Real-time

Enable capabilities that traditional non 3D could never accomplish.

- Multi user collaboration at any scale
- System of systems, simulation,
- personalization of the experience (e-commerce, safety)
- Real-time analytics (creators and operators collaborating together)

Distribute

We enable customers to take data and distribute it broadly. We bring the ability to combine previously siloed data together,
and distribute across ours and other platforms.

Digital twin maturity model

LEVEL 1

Virtual Twin

The Level 1 twin is a physically accurate realistic digital representation of an asset, facility, or product that emulates its real-world counterpart

Keywords

- Spatial awareness
- Interaction
- Experience
- Collaboration

LEVEL 2

Connected Twin

The Level 2 twin integrates real-time and right-time data to provide insights into the performance of an asset at specific points in time.

Keywords

- Real-time data
- Monitoring and reporting
- IoT

LEVEL 3

Predictive Twin

The Level 3 twin leverages data to predict the outcomes and problems for the operations of complex facilities and equipment.

Keywords

- Analytics
- Decision-assist
- Predictive maintenance

LEVEL 4

Prescriptive Twin

The Level 4 twin leverages advanced modeling and real-time simulation for potential future scenarios as well as prescriptive analytics and recommendations.

Keywords

- What-if simulation
- Machine learning
- Intelligent recommendations
- Process optimization

LEVEL 5

Autonomous Twin

The Level 5 twin uses multiple real-time data feeds to learn and make decisions to correct issues automatically and enable predictive and prescriptive analytics.

Keywords

- Autonomous action
- Artificial Intelligence


Digital Twin Platform /
Industrial Metaverse
Unity


Unity
provides the **platform** that lets Industries reimagine the way they solve business challenges using Real Time 3D technology.
Unity helps to increase delivery velocity in Digital Twin solutions. Our Accelerate Solutions team will help to build capability and capacity to drive Digital Twin solutions across the Energy sector.
Unity®

Unity Digital Twin Ecosystem

Ingest

- 3D Scan
- Record
- 3D Author (CAD/BIM)
- Design
- Geospatial
- Asset Management (Maximo)
- ERP

Other Platforms / Databases and Systems:

esri NAVVIS VERUM

Cloud & Optimize

Unity

Unity Platform

Creator Tools

Unity Editor

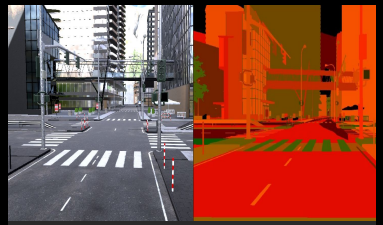
Weta Tools

Deploy

... 20+ Platforms

Innovation

Toolkits, Frameworks, Packages & Services

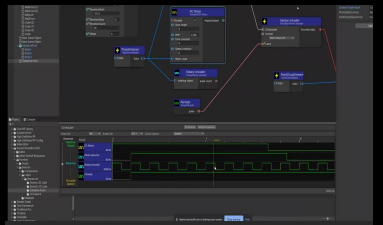


Unity Computer Vision

Use Perception toolkit to support large synthetic datasets generation, with realistic sensors, automatic ground-truth labeling, complex scenarios. Unity's CV experts will build a dataset for you.

Unity Robotics

Create and model highly customizable real-world situations for robot design and simulations.

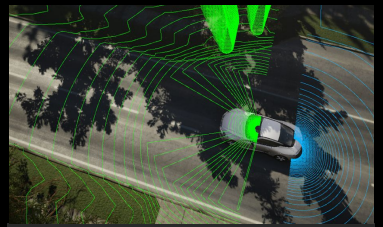


Unity SystemGraph

Support the functional modeling of IoT and electro-mechanical systems in Unity by using a node-based editor extension and runtime framework

Unity Geospatial

Enable the creation, streaming and rendering of large synthetic environments based on real-world geospatial data



Unity Sensor SDK

Support the creation and use of accurate sensors within Unity with focus on simulation solutions.

Unity ML-Agents

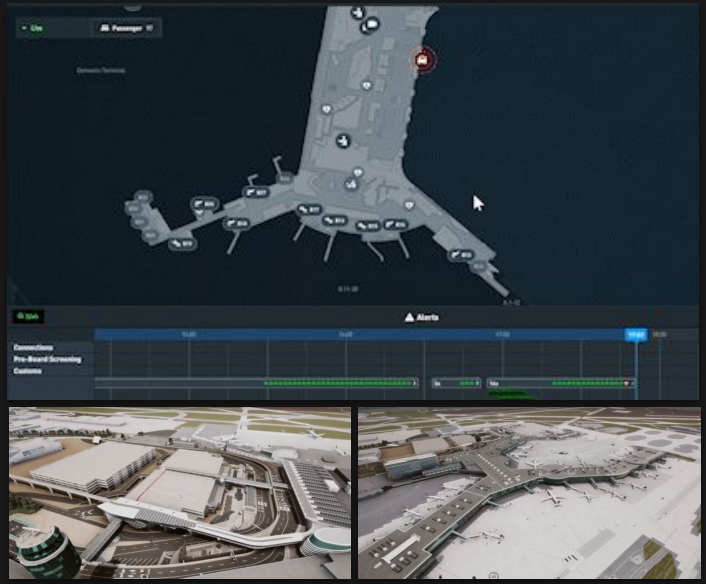
Train intelligent agents with reinforcement learning and evolutionary methods via a simple Python API.

We align your key business challenges or opportunities with our real-time technology expertise.

Vancouver International Airport Digital Twin

Facility & Infrastructure Digital Twin

Digital Twin | Alerts | Reality Capture | CCTV Analytics



Overview

YVR and Unity worked together to build a foundational Digital Twin of the airport, initially focused on situational awareness. The Digital Twin also incorporates the reality capture of the airport.

Challenge

- Proactive in responding to passenger flow
- Optimize integrated services based on passenger volume changes
- Resource allocation

Solution

- 2D Digital Twin to model passenger volume, display wait times, display and log alerts and connection to CCTV analytics
- 3D Digital Twin via Reality Capture to future use cases such as emissions tracking, aircraft and fleet simulation

Results and Value

- Phase 1 development complete and is undergoing user testing to continue to collect feedback for further feature development
- This is the first to market RT3D digital twin for airports in N.A

Sitowise

of Oulu digital twin

The Port

AECO | Digital Twin | XR

Challenge

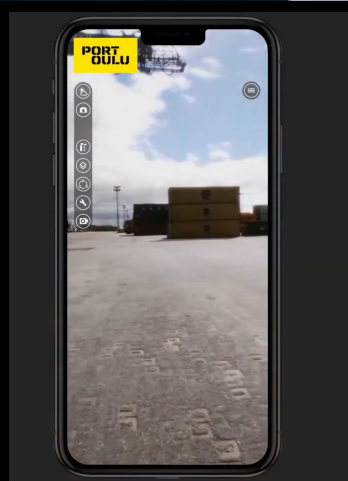
- Even slight delays in loading and unloading goods can have an exponential impact on the efficiency of port operations

Solution

- Aura, Sitowise's in-house virtual 3D environment for visualization, data management, and collaboration that was built with Unity
- A full digital twin of the port infrastructure linked to various IoT sensors and data sources

Results

- Removed bottlenecks and reduced environmental impact of transport and logistics
- Increased security/safety and reduced costs
- Improved efficiency and reliability



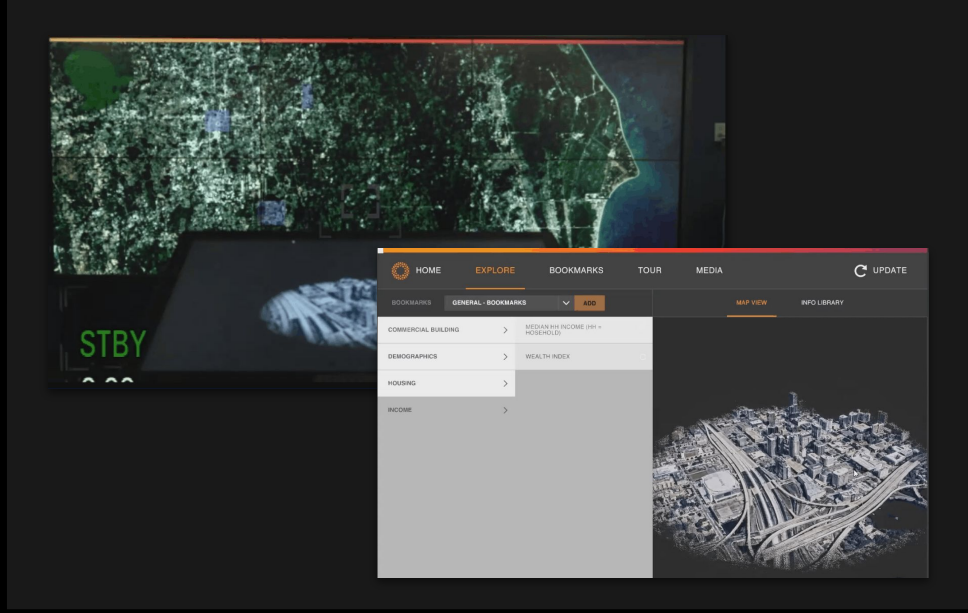
Unity × ORLANDO ECONOMIC PARTNERSHIP

Orlando Economic Partnership Florida, USA

Regional Digital Twin for Economic Investment

Digital Twin | Tech Component | XR

Asset CMS & UI | Geospatial | GIS Data API's



Overview

Provide an immersive Digital Twin experience to solicit economic investment.

Challenge

- Enable broad regional economic pitch
- Correlate and display various data sets
- Integrate with multiple room displays

Solution

- Unity Geospatial data sets
- StoryTelling framework to highlight and select client appropriate info
- Establish approach to scalable platform

Results and Value

- Initial client pitches to economic board very well received
- Multiple business and data partnerships interested in platform opportunity potential
- Establishing connections with other regional interest and broader vertical use cases

Thank you.