Dual-Mode Crowd Management for Emergencies and Everyday Concept and Prototype

Kazuya Tanaka
Chief Strategy Officer
scheme verge, Inc.

Kazuya Tanaka

Chief Strategy Officer
Technology Director
scheme verge, Inc.

Past Jobs / Projects

- Citibank
- World Bank
- Matsuo Lab, the University of Tokyo
  (AI-driven Industry Innovation Laboratory)
- DEEPCORE
  (Softbank-based AI VC)

scheme verge is a leading smart-city startup from UTokyo, driven by an interdisciplinary team from the Urban Engineering and AI.

The scheme of scheme verge

scheme verge

UrbanTech

=

Urban Engineering

UTokyo

東大都市工学

×

AI & Data Engineering

UTokyo

東大松尾研究室

We revolutionize urban management to unlock new lifestyle possibilities.

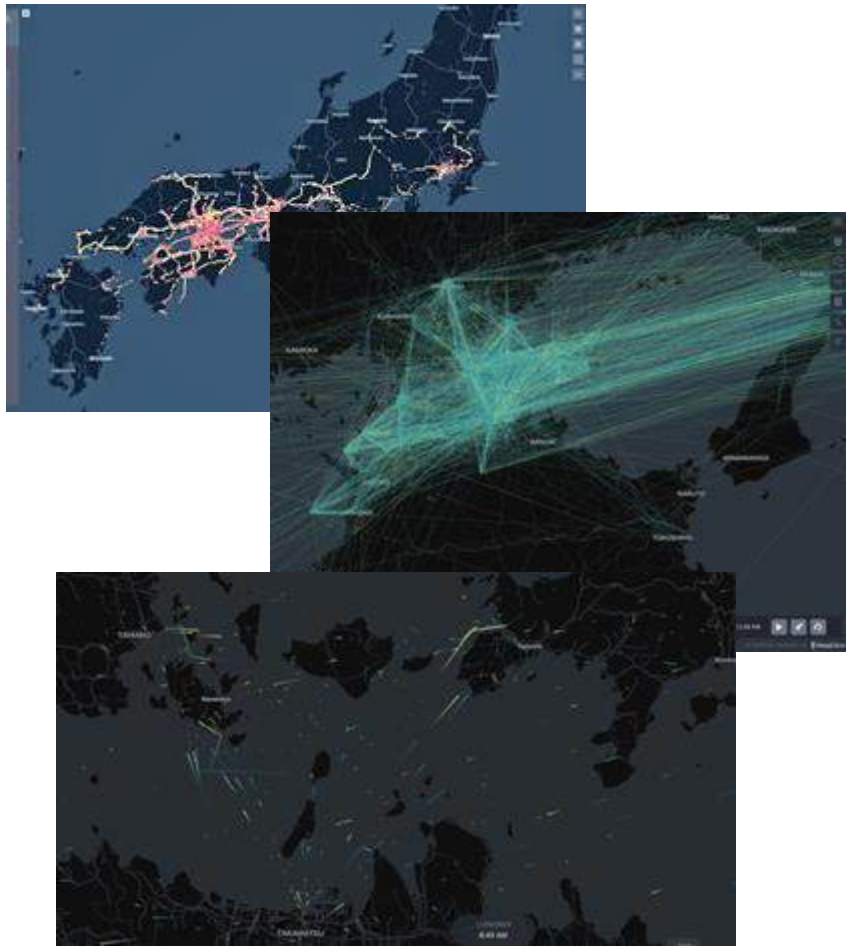
Business 1

Digital Solutions for Urban Management

Business 2

Planning, development, and management of smart city

We fully utilize people flow data fetched and assembled from smart devices in cities.



- **City Planning**
- **Transport & Mobility Management**
- **Tourist Event Planning**
- **Commercial Facility Management**
- ...

Analytics & Processing

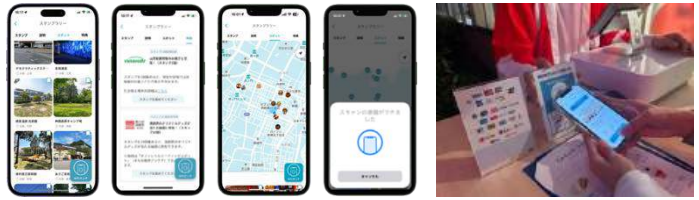
Management & Actuation

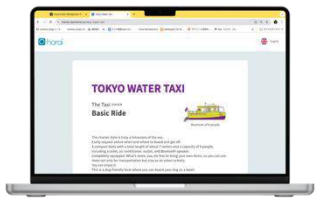
City Planning

Transport & Mobility Management

Tourist Event Planning

Commercial Facility Management

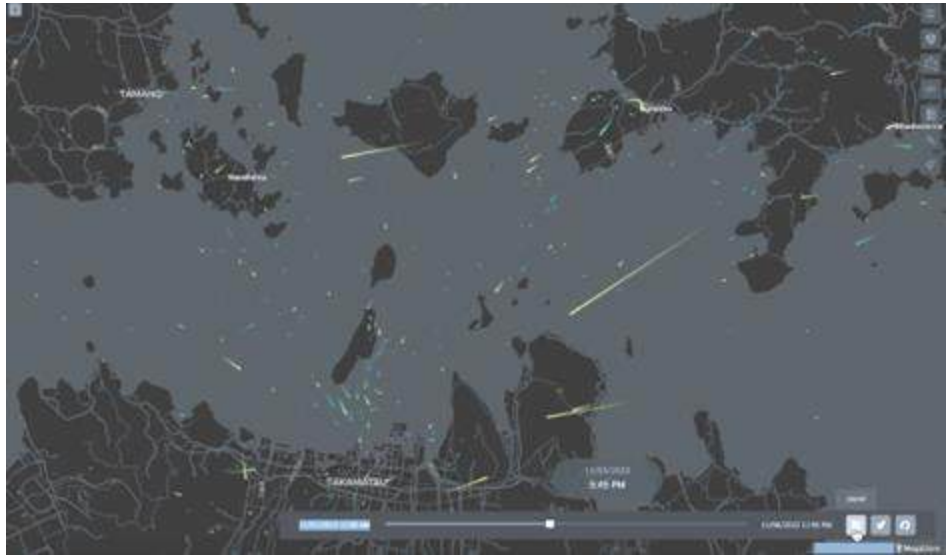




Planning / Marketing / Management through the Cloud-based Analytics of Footfall Data

Case Study on Setouchi Triennale Official App Data

- **Example 1:** Understanding population dynamics by day, time slot, and movement patterns.
- **Example 2:** Automatically identifying and visualizing circulation & stay patterns through clustering.



Changes in the number of Setouchi Triennale participants during the day and night based on location data from the 2022 official app.

		クラスターの存在件数（割合）
	滞在	35.25%
	館エリア）→宮浦で移動しながらの滞在	5.78%
	動しながらの滞在	5.86%
	動しながらの滞在	10.36%
	エリア→本村で移動しながらの滞在	11.96%
クラスター6	本村がメインで他にも行ってる	5.94%
クラスター7	本村→宮浦→美術館エリアで移動しながらの滞在	6.48%
クラスター8	主に宮浦のみで滞在	4.62%
クラスター9	宮浦→美術館エリアで移動しながらの滞在	13.74%

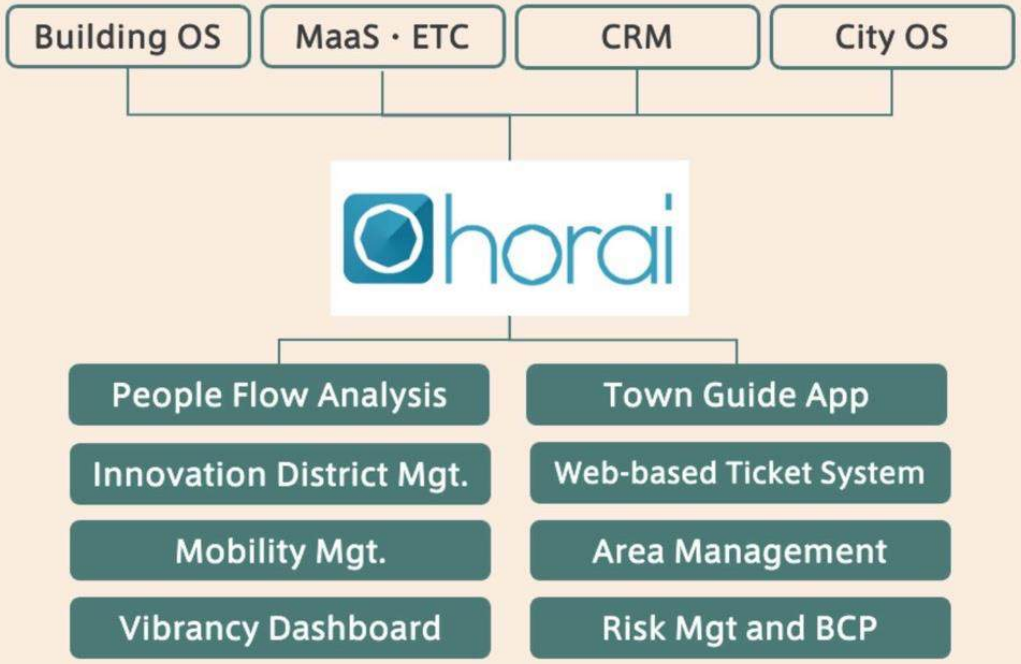
Classification and visualization of circulation and stay patterns using trajectory clustering (example image: Naoshima).

Product Overview

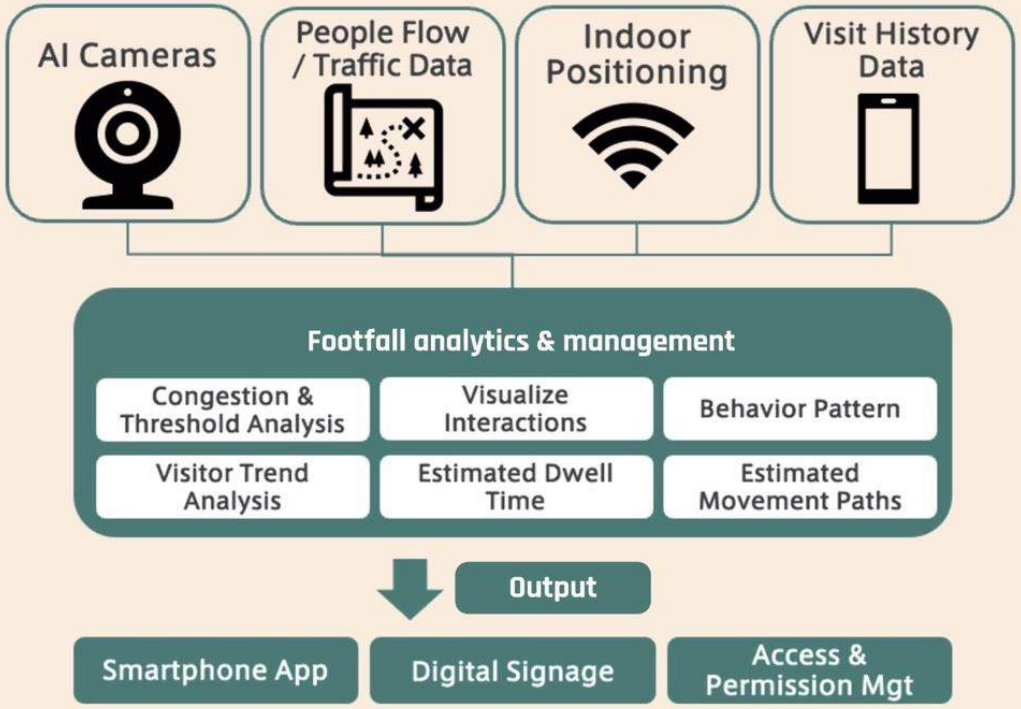
Our platform: horai series products

Horai is a series of products which work as the cross-domain data integration platform -

for managing and activating facilities and areas, across buildings, mobility, commerce, and more.



Smart crowd & urbanmanagement through data—responding instantly to what's happening on the ground.



Product Overview

Our platform: horai series products

Horai is a series of products which work as the cross-domain data integration platform -

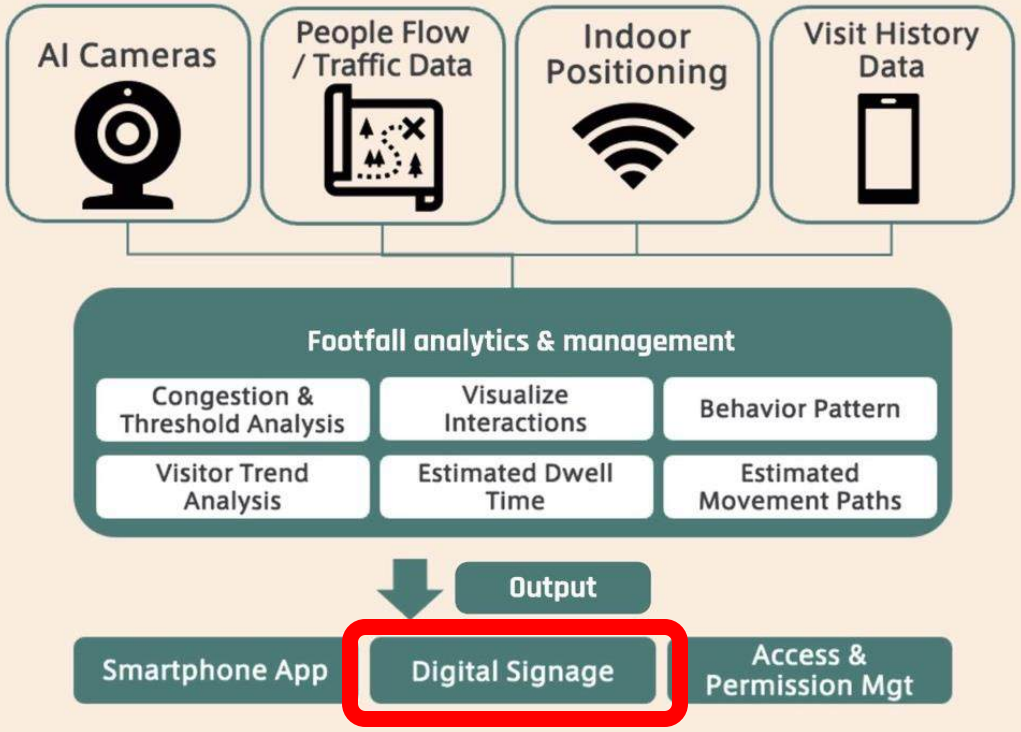
for managing and activating facilities and areas, across buildings, mobility, commerce, and more.

Building OS | MaaS・ETC | CRM | City OS

horai

- People Flow Analysis
- Town Guide App
- Innovation District Mgt.
- Web-based Ticket System
- Mobility Mgt.
- Area Management
- Vibrancy Dashboard
- Risk Mgt and BCP

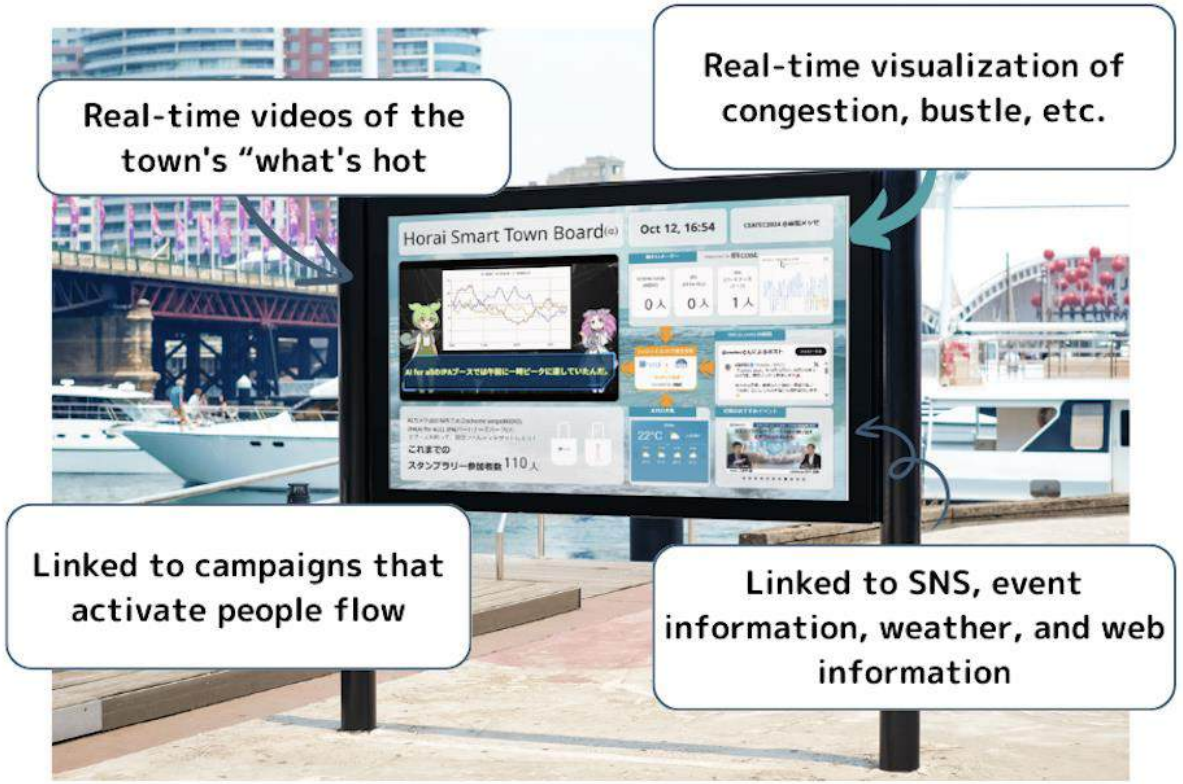
Smart crowd & urbanmanagement through data—responding instantly to what's happening on the ground.



Horai Smart Town-board (Cloud-based Software for Collective Management of Signages)

Real-time and place-specific video recommendations powered by AI

- Developed through a project of NEDO (a national R&D agency by METI)



新虎安田 ビルまちガイド

11/20

現在の天気

今夜の天気

新虎紹介ちゃんねる*

＊スマートビルに集約されたデータに基づき自動生成しております

ビルご利用者向け優待

近隣店で使える優待クーポンが
1,000 ~ 1,500 円分もらえる！

更に３つハシゴで追加クーポンのスタンプラリーも…

ご同僚やお取引先、ご友人との交流に
ぜひご活用くださいませ。

＜ご参加方法＞

新虎安田ビルの
DX-Coreユーザは…

DX-Core

horai

の2つのアプリを連携

ほかの一般の方は…

こちらのWebアンケートから参加

おすすめ地域情報

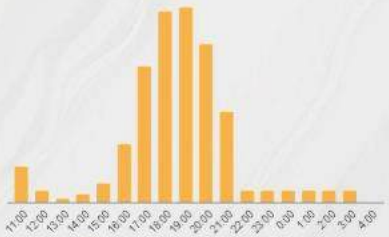
小虎小路

KOTORA KOMICHI

小虎小路
\日本の"祭り"をモチーフにした居酒屋横丁/

東京都港区虎ノ門1-16-4
アーバン虎ノ門ビル 地下1層

小虎小路の賑わう時間帯



タウン ガイドアプリ「Horai」の
利用はこちらから

horai

(QRを読むとApp StoreまたはGoogle Playを起動します)

Application to Disaster Management

@dailymail

Use Signages and Footfall Data

Collective Control of Signage Information
- Place Specific Suggestion of Evacuation
- Avoid Congestion or Crowd Accident
- Provide Right Information

Optimize Evacuation
and Business Continuity Plan

DISASTER MANAGEMENT

horai Evacuation Flow Management Using Algorithms

Summary of the Initiative

This project simulated the minimization of evacuation decision-making time during disasters. Going forward, by integrating with City OS and building OS, the system is expected to conduct model simulations using real-time people flow data and population change data to optimize evacuation routes.

Objective

Crowd Flow Management during Emergencies

Project Workflow

- **Hypothesis Development** — Test whether evacuation behavior can be optimized using algorithms. (e.g., simulate a severe inland earthquake in Kobe City.)
- **Results and Analysis** — Model crowd density right after the quake under fixed conditions, and simulate evacuation patterns.
- **Identifying New Challenges** — As crowd density constantly changes, real-time data and clearer evacuation guidance are needed.

Displaying disaster information after impact

Designed for instinctive, immediate recognition of shaking

Approach

Algorithm Design

✓ The algorithm assigns people to shelters by analyzing real-time population data across map grids, factoring in crowd density and estimated evacuation time to avoid overcapacity.

Content

- Real-time shelter matching results are displayed per mesh area.
- Based on simulation results, evacuation alerts are shown with urgency levels.

Legend: Estimated Population per Area
Red: 12,500+ Yellow: 6,000+
Yellow-Green: 3,200+ Green: 1,600+
Cyan-Green: 800+ Light Blue: 400+
Gray: 200+ White: Less than 200

Overall Framework

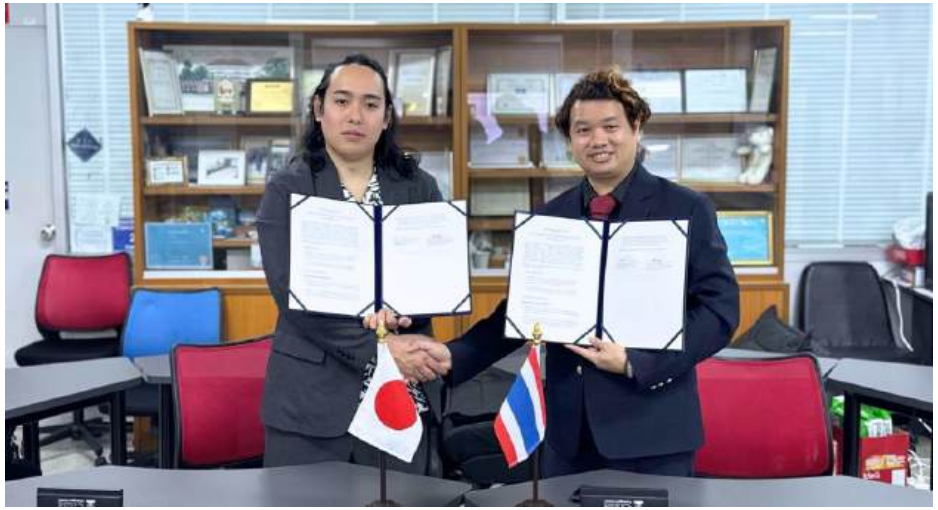
✓ Using real-time footfall and hazard data, evacuation scenarios were analyzed with Horai's algorithm.

✓ Combined data from smart town boards and signage to simulate and evaluate shelter allocation patterns and congestion levels.

It’s time for a demonstration.

We are looking for partners.

Example:
Collaboration with Chulalongkorn University
(Signed MOU with DRMIS, Chulalongkorn University:
DRMIS = the Disaster Risk Management Information Systems Research Unit)



The aim of collaborating on the following areas:

1.To develop disaster management solutions using real-time data (people flow data, etc.) and AI (Machine Learning, Deep Learning, Generative AI, etc.).

2.To incubate spinout startup business using the disaster management solutions developed through the two's collaboration, especially focusing on city safety of Thailand and other ASEAN countries.