

Combain Indoor

- World-class accurate 3D Indoor positioning using deep learning
- Easy and cost-effective deployment using existing infrastructure

Seamless
Indoor &
Outdoor

combain
positioning solutions

Combain Indoor is an Indoor Positioning System (IPS) to enable accurate location-based services inside buildings where GPS signals are weak or unavailable. The system uses existing Bluetooth beacons and Wi-Fi access points for positioning, so no new hardware or infrastructure is required and implementation is very simple and cost-effective. Combain Indoor includes tools to create and manage the indoor positioning: a portal to set up a building and an app to collect training data for the positioning system. After collecting training data, deep learning algorithms are used to create a building model using an artificial neural network (ANN). After creating and publishing the building model, the indoor positioning is available to all devices via the Combain Location API.

Indoor positioning can be made available for all Combain Location API users or kept private for use only by own API keys. For even higher privacy, it can be combined with Combain On-Prem Location Server to create a completely private positioning system running on your own servers.

Combain Indoor features:

- World class accuracy. The actual accuracy depends on building and beacon density, but normally 2-5m median error is obtained for public spaces. Using deep learning typically improves accuracy by at least 2x.
- Easy to deploy. Since the system uses existing infrastructure, the deployment step is just to survey the area to capture enough training data. No need for manual system set up or deployment of new routers or beacons like traditional indoor positioning systems.
- On-line portal to create buildings, add indoor maps, routes for navigation, define rooms and add indoor features such as stairs, elevators and escalators.
- On-line tools that for example shows estimated accuracy in different parts of the building, so that extra beacons can be added if desired accuracy is not met.
- Android app for survey and capture of training data. Alternatively, you can purchase a survey device from Combain as there are certain requirements on the mobile to capture training data efficiently (Android version, WiFi throttling, etc).

Tools to enable accurate indoor positioning

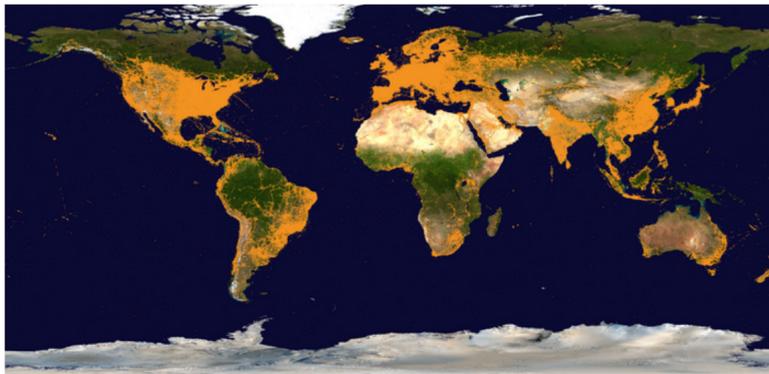
Indoor positioning has become increasingly important in recent years due to the rise of indoor location-based services and the increasing demand for smart buildings and indoor navigation.

- Asset Tracking: Combain Indoor can be used to track the location of assets, such as equipment and inventory, within a building. This can help businesses optimize their operations and improve efficiency.
- Indoor Navigation: Combain Indoor includes route management and can be used to provide users with turn-by-turn directions inside large buildings, such as airports, hospitals, and shopping malls.
- Indoor Analytics: Combain Indoor can be used to collect data about how devices move through a building, such as which areas are the most crowded or which routes are the most commonly used. This data can be used to optimize building layouts and improve the user experience.
- Proximity Marketing: Combain Indoor can be used to send targeted marketing messages to users based on their location within a building. For example, a retailer could send a promotion for a product to a user who is standing near that product in the store.
- Security & Safety: Combain Indoor can be used to improve safety in buildings by alerting users to potential hazards or emergency exits. This can be especially important in large or complex buildings, such as hospitals, industrial or office buildings.

Overall, Combain indoor positioning has the potential to enhance the user experience, improve efficiency, and increase safety in a variety of indoor settings.

About us

Combain provides a range of global positioning solutions. One of the core assets is the huge crowdsourced global location database.



Combain provides access to this database by

- Combain Location API
- Combain On-Prem Location Server

and improves the indoor positioning accuracy by

- Combain Indoor
- Combain 5G Positioning Engine

Seamless Indoor & Outdoor

Combain products and services help you to locate devices or people carrying a device, either indoor or outdoor. GNSS has no or poor indoor coverage. Combain has crowdsourced indoor positioning data and created accurate indoor positioning in millions of buildings. Combain also has the Combain Indoor tools to enhance indoor accuracy.

Global Coverage

Combain's products and services help you locate devices globally. Combain has coverage in all 195 countries in the world. One world - one API. Combain works with customers and crowdsourcing partners that help collect data from millions of devices. The data continuously helps to improve the coverage and accuracy of the Combain Location API service.

Private & Secure

By using Combain's products and services, your positioning usage will not be shared with any third party. Your data will not be used for any type of profiling or advertising. Your positioning results, the location of your devices or personnel are your personal data.

TOTAL NUMBERS	
GSM	> 31 000 000
WCDMA	> 69 000 000
CDMA	> 2 000 000
LTE	> 41 000 000

REGION	NUMBER OF CELLS
EUROPE	51 000 000
USA	14 000 000
NORTH AMERICA	19 000 000
ASIA	45 000 000
PASIFIC	13 000 000
AFRICA	6 000 000
SOUTH AMERICA	9 000 000

STATISTICS PER FEBRUARY 2023. SEE WWW.COMBAIN.COM FOR LATEST STATS.

World-class accuracy

Since the beginning, Combain has had a strong focus on building an accurate location service. Combain began researching and developing proprietary and patented algorithms to process incoming crowd-sourced data and for providing accurate location.

Combain often provides a better median error than other geolocation services. Typical median error seen in urban areas with cell id is about 100 meters. For indoor environments using Wi-Fi and/or Bluetooth, you can get 2-5 meters and correct floor after some optimizations with Combain Indoor, or 10-20 meters "out-of-the-box".

Contact Combain

Visit us at www.combain.com and sign-up for a free trial. Please send an email to sales@combain.com for commercial inquiries.

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