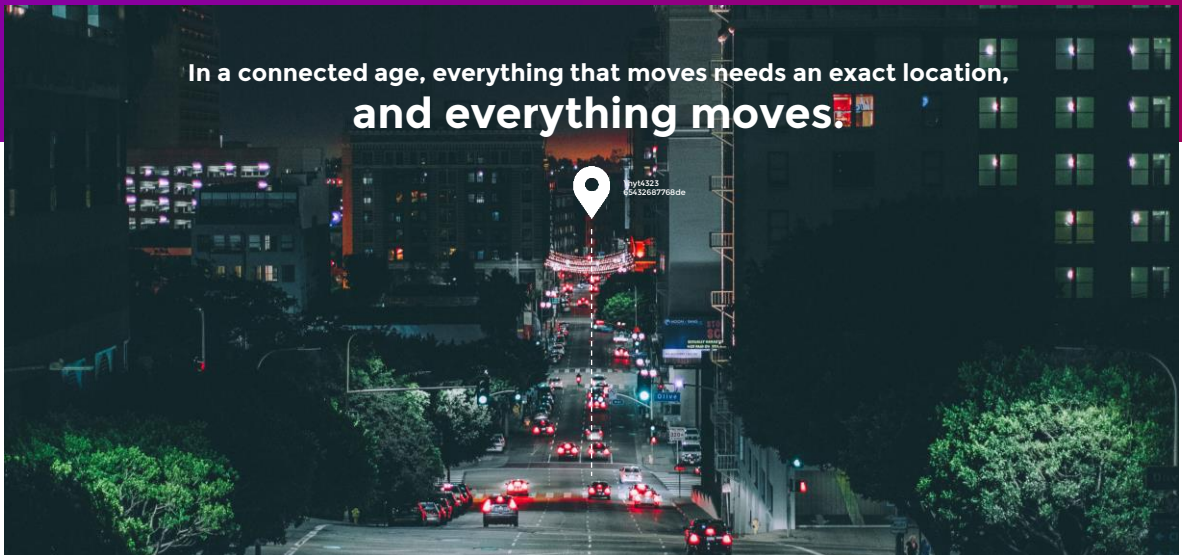# DEEYOOK

Straight to the point

In a connected age, everything that moves needs an exact location,
and everything moves.

HIGHLY PRECISE LOCATION AS A SERVICE
Made possible through a patented wireless-based firmware solution that is self-learning, ubiquitous, ultra-precise (~10 cm), passive and low power, allowing absolute indoor and outdoor position determination.

ASSET TRACKING | PEOPLE TRACKING

INDOOR (via WIFI) & OUTDOOR (via WIFI, LTE and 5G)

ANY ASSET:
Stationary i.e., long-term vehicle storage, office assets, etc.
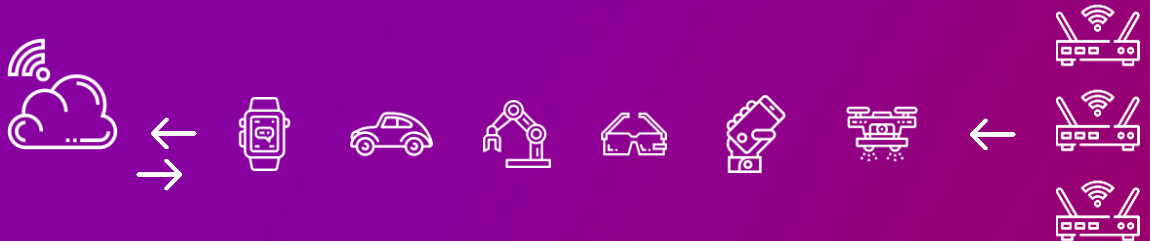**Portable** i.e., packages, luggage, shipping pallets, etc.
Mobile i.e., scooters, drones, etc.

ANY PERSON:
Employees, customers and first responders

ANY VEHICLE:
Cars (Uber), Cargo Ships, AGVs

KEY FEATURES

Utilizes ubiquitous infrastructure of 1.7 billion APs and base stations from DAY 1

All it takes is a client-based Firmware upgrade

Passive and non-invasive location-data extraction

10cm accuracy – 4 inches

Power consumption is a fraction of that of a GPS (no satellite acquisition)

Effective and robust, both indoors and outdoors (weather proof)

Super fast cloud connection due to thin pipe backhaul & offline operation

Self improving by implicit crowd sourcing and machine learning

A TECHNOLOGICAL BREAKTHROUGH

The Deeyook sensor is based on wireless interferometry: The difference in carrier phase between two free-space rays is translated into an angle: the direction of departure.

Two granted patents:
Patents US 9,814,051 B1 & US 10, 182,315 B2
Identifying angles of departure of multi-antennas transmitters

Seven additional patents are currently in process

Angle of Departure

Ray 1

Microwave

Ray 2

TX

OFDM

Linear Array

Any device that carries our firmware

Far Field
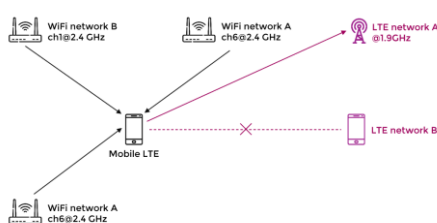
Single Antenna

SENSOR
RX
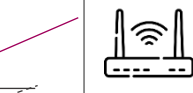
ACCESS POINT:
To calculate the angles, we use any two-antenna device, ranging from home routers (which we use without needing to connect to) to cellular antennas (LTE & 5G).

MACHINE LEARNING ADVANCED POSITIONING

1. Unsupervised estimation of AP parameters using multivariate optimization

2. Location prediction using Bayesian probability maps based on physical modeling and sensitivity analysis stitching of nearby mapped areas

3. Embedding in WGS 84 coordinates

EXSITING CELLULAR MODEM TO IMPLEMENT WIFI LOCATIONING

Proprietary firmware can use cellular (LTE or 5G) modem to enable WIFI positioning

WiFi network B ch6@2.4 GHz

WiFi network A ch6@2.4 GHz

LTE network A @1.9GHz

LTE network B

Mobile LTE

WiFi network A ch6@2.4 GHz

WiFi network A ch6@2.4 GHz

D/C – Down Converter
ADC – Analog →Digital Converter

LET comm
WiFi Locationing

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