Description of inertial sensor based indoor location tracking solution
for 2018 Microsoft Indoor Localization Competition

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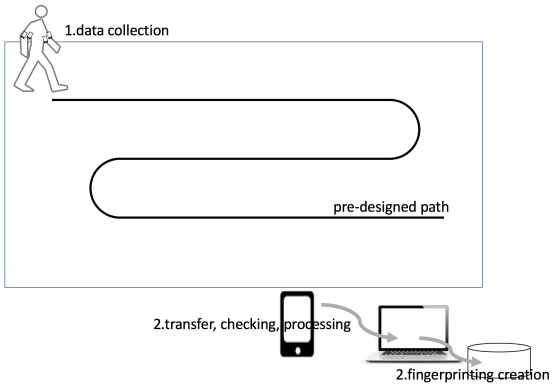
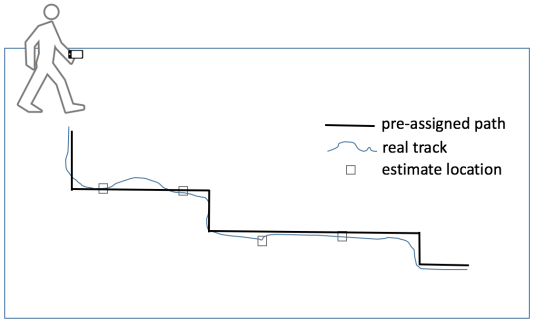
ABSTRACT
We, Fineway Technology, signed up for 2018 Microsoft Indoor Localization Competition and will join in the Commercial off-the-shelf (COTS) Technologies with Initialization group. We are from China and focus on the forefront of scientific and technological innovation for a long time, involving indoor positioning, robotics, artificial intelligence and other cutting-edge areas. In this artical we will describe our solution for this competition.

DESCRIPTION
Our solution is based on human stride-model analysis combining with geomagnetic positioning and WiFi-fingerprinting technology. Because geomagnetic field and WiFi signal should be fill the environment, we can receive them with a mobile phone with proper sensors. So what we need is the mobile phones running our algorithm for estimating the location and apps for collecting the environment information, some laptops using for processing data, and something like switch cable, charger (the detailed info. about our devices will be listed below).

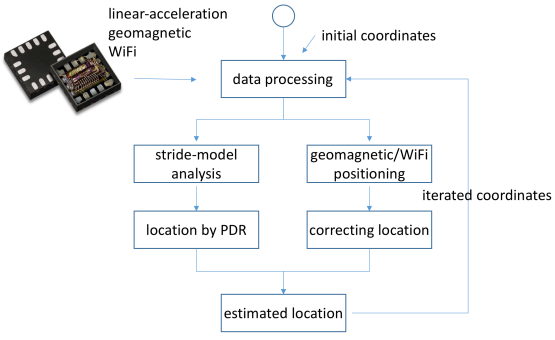
Next we introduce our plan. In the first day for setup, we plan to collect data and create fingerprinting. Our member will walk through a path pre-designed for the site with the phone attached and the collecting app running on it. Then we use laptop to transfor out the data collected from the phone. After checking and processing the data, we finally create the fingerprinting for use in the next day.



In the next day, we use one of the phones to run our algorithm and go along the path assigned by the organizer. The App running on the phone will estimate the location on the track in real time and output the coodinates at the specified point.



ALGORITHM DESCRIPTION
The whole process is an iteration process based on inertial sensors. The key algorithm for this competition is the patented technology of our company. It uses the linear-acceleration data and gyroscope data received from motion sensors on the iOS/Android mobile phone, figures out the location via data checking, processing and analysis with the stride-model, then modifying the location by a geomagnetic/WiFi correction process.



TEAM MEMBERS

We formed a 10-person team for this competition including algorithm researcher, software developer, tester and project manager, listed below:

Name	Duty
Mr. Chi Zhang	Manager
Mr. Ming Lyu	Researcher & Developer
Mr. ZiLiang Wang	Researcher
Ms. BaoZhen Yuan	Researcher
Mr. JiaXin Wang	Developer
Mr. YinPeng Sheng	Developer
Mr. YongSheng Hu	Tester

Mr. Chi Zhang and Mr. Ming Lyu will be the representatives to go to competition site at Porto.

DEVICES WITH US

Our solution for this competition is no infrastructure dependency. The devices we use listed below:

Device	Brand & Model
Mobile Phone	MI
	Google Pixel
	Apple iPhone 8
Laptop	Apple Mac Pro