

User Interaction: Intro to Location

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INF 133 Fall 2014

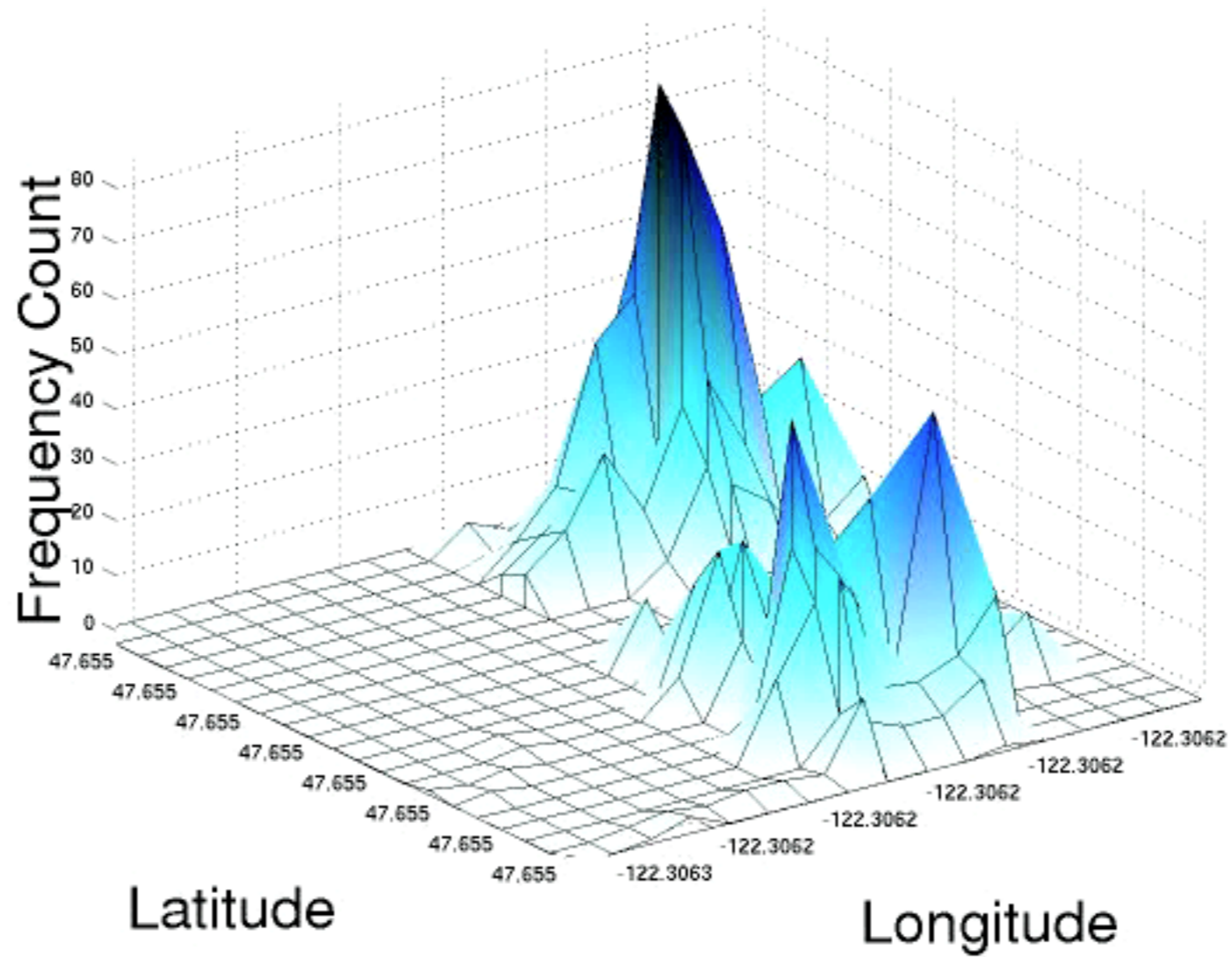


Global Location GPS

- GPS accuracy
 - 13 m 95% of the time horizontal
 - 22 m 95% of the time vertical system
 - 40 ns 95% of the time
 - How do you design for this?
- Urban canyons
 - What are they?
 - Japanese response, European response



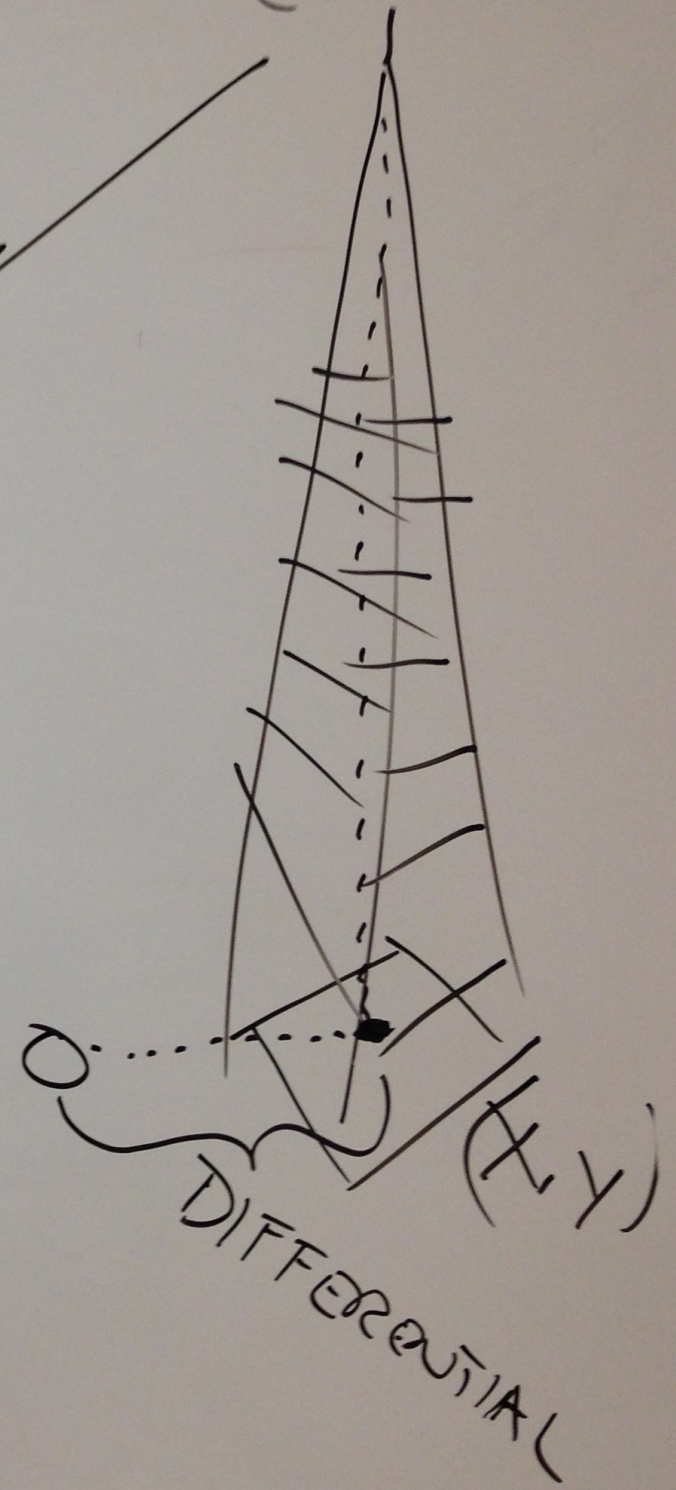
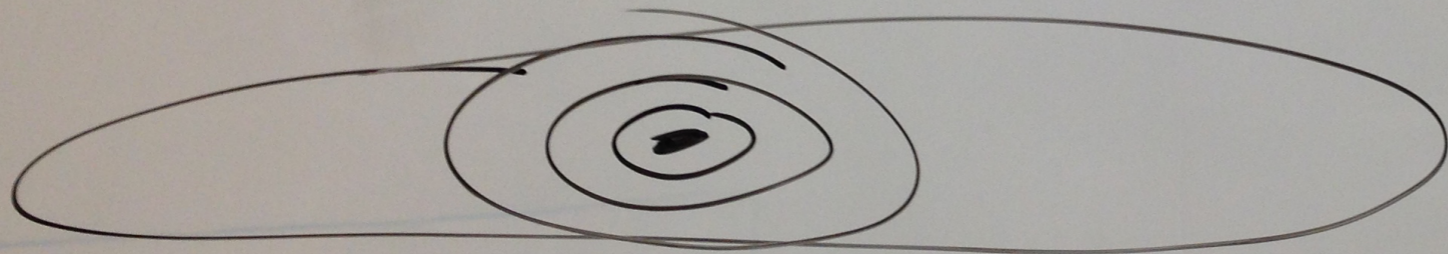
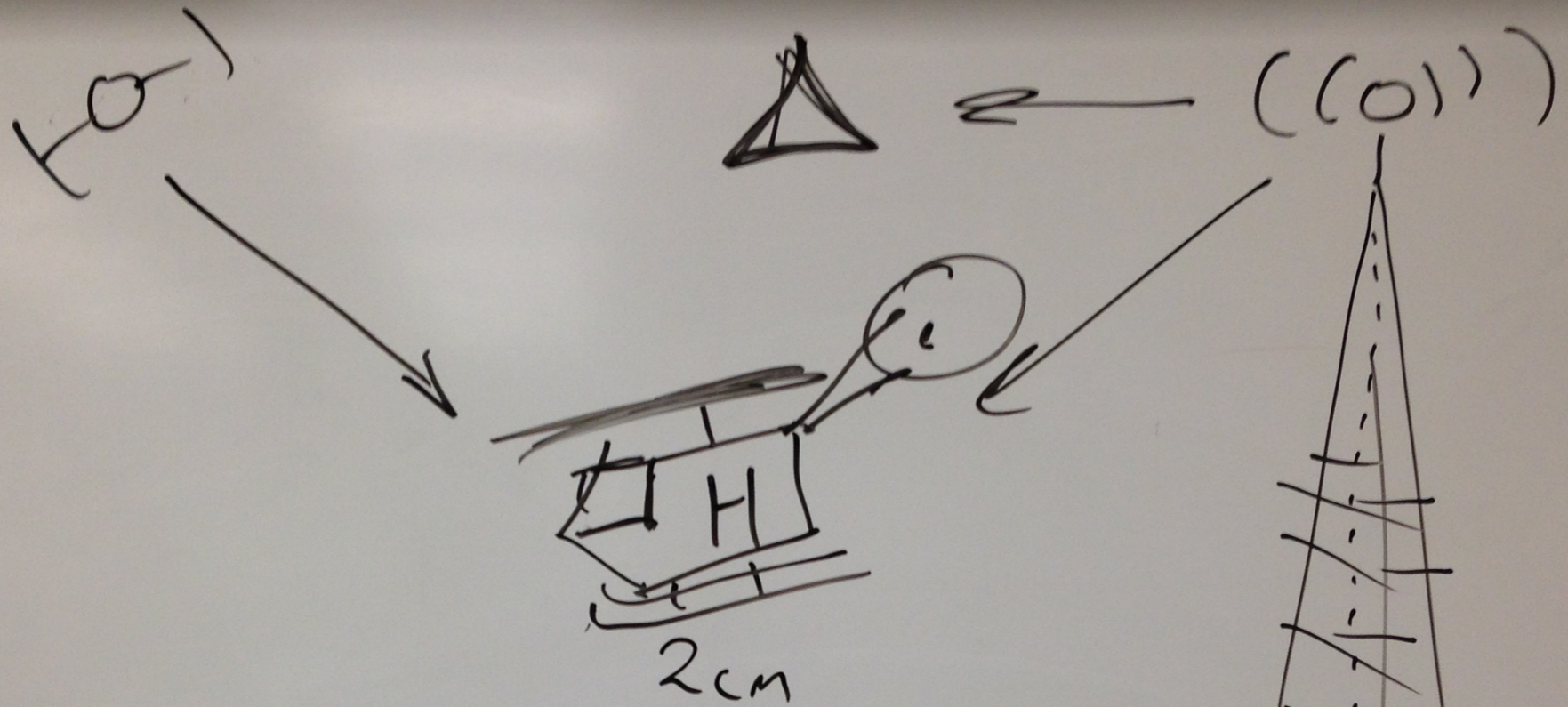
Global Location GPS



Global Location GPS

- The current and future of GPS
 - WAAS
 - Additional satellites in geosynchronous orbit
 - DGPS assistance from a land based receiver
 - Galileo
 - European competitor
 - GPS compatible
 - GLONASS
 - Russian competitor





Apple iPhone 6



[iPhone 6 vs. Galaxy Alpha vs. Xperia Z3 Compact: Three kings](#)

[Apple iPhone 6 review: Scaled to order](#)

[Apple iOS 8 preview: Opening Up](#)

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CHECK PRICE

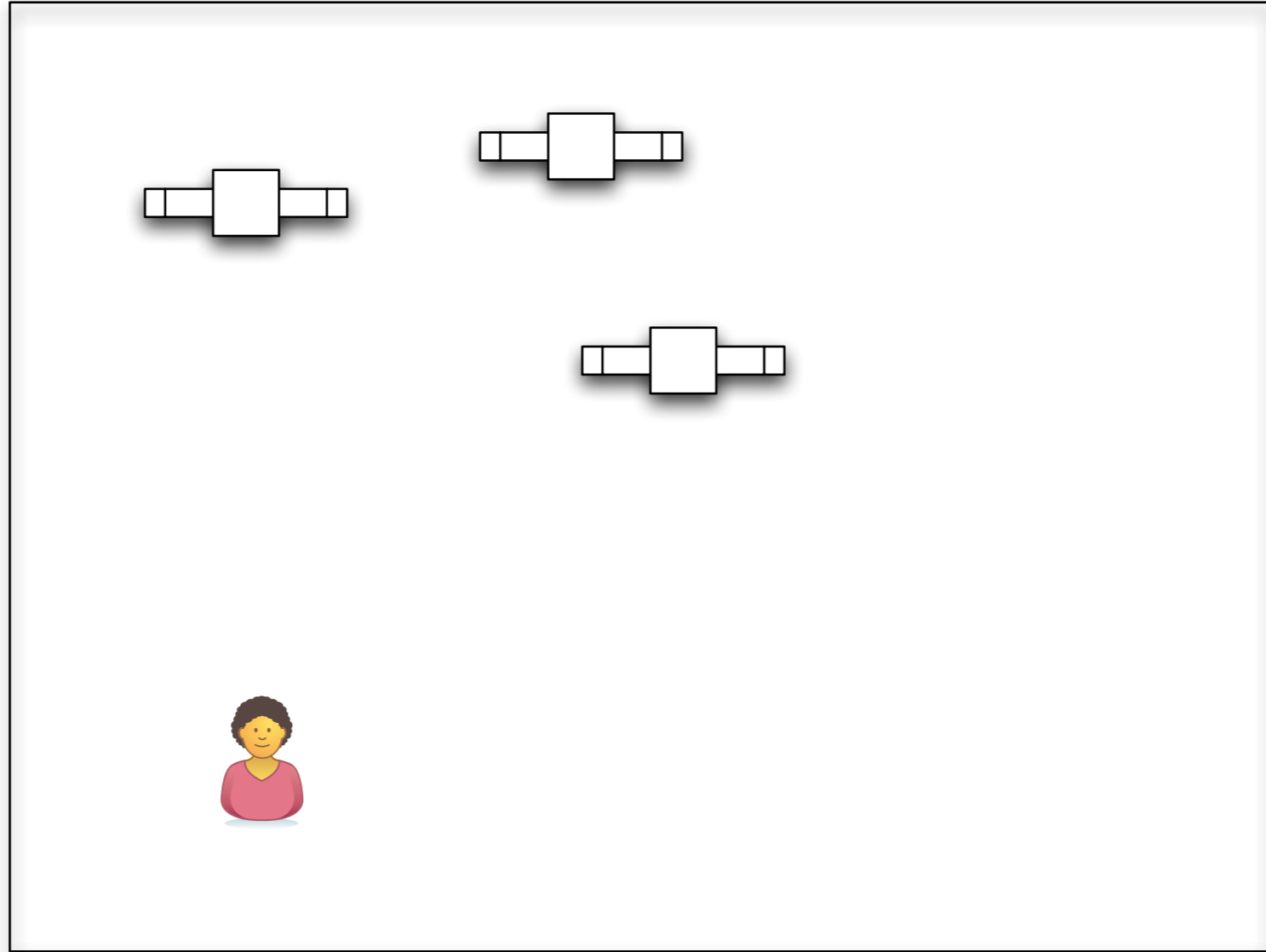
GENERAL	2G Network	GSM 850 / 900 / 1800 / 1900 - A1549 (GSM), A1549 (CDMA), A1586 CDMA 800 / 1700 / 1900 / 2100 - A1549 (CDMA), A1586
	3G Network	HSDPA 850 / 900 / 1700 / 1900 / 2100 - A1549 (GSM), A1549 (CDMA), A1586 CDMA2000 1xEV-DO - A1549 (CDMA), A1586 TD-SCDMA 1900 / 2000 - A1586
	4G Network	LTE 700/800/850/900/1700/1800/1900/2100/2600 (1/2/3/4/5/7/8/13/17/18/19/20/25/26/28/29) - A1549 (GSM), A1549 (CDMA) LTE 700/800/850/900/1800/1900/2100/2600 TD-LTE 1900/2300/2500/2600 (1/2/3/4/5/7/8/13/17/18/19/20/25/26/28/29/38/39/40/41) - A1586
	SIM	Nano-SIM
	Announced	2014, September
	Status	Available. Released 2014, September
BODY	Dimensions	138.1 x 67 x 6.9 mm (5.44 x 2.64 x 0.27 in)
	Weight	129 g (4.55 oz) - Fingerprint sensor (Touch ID) - Apple Pay (Visa, MasterCard, AMEX certified)
DISPLAY	Type	LED-backlit IPS LCD, capacitive touchscreen, 16M colors
	Size	750 x 1334 pixels, 4.7 inches (~326 ppi pixel density)
	Multitouch	Yes
	Protection	Shatter proof glass, oleophobic coating - Display Zoom
SOUND	Alert types	Vibration, proprietary ringtones
	Loudspeaker	Yes
	3.5mm Jack	Yes
MEMORY	Card slot	No

Global Location GPS

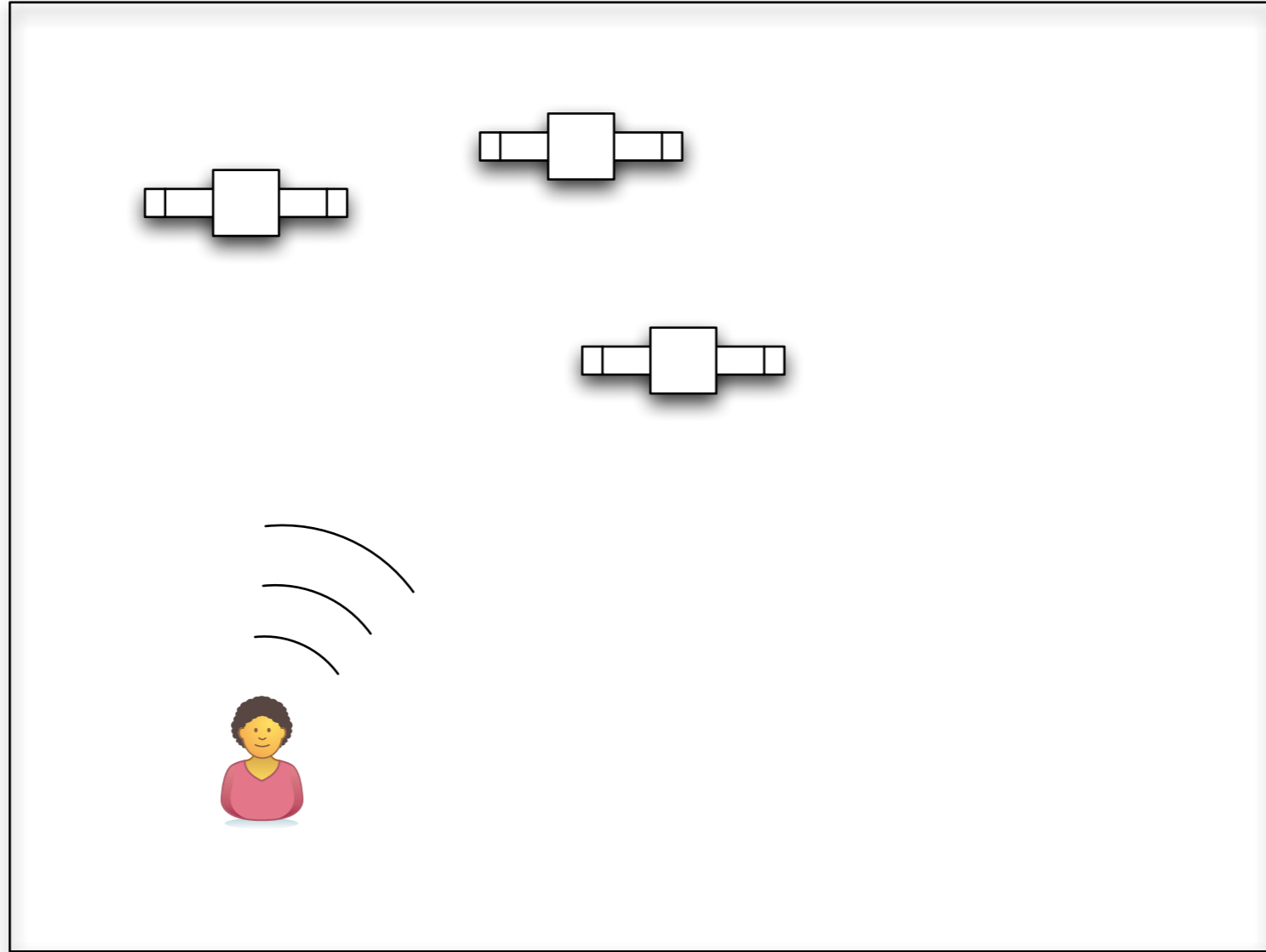
- The current and future of GPS
 - BeiDou
 - Chinese competitor
 - centralized system

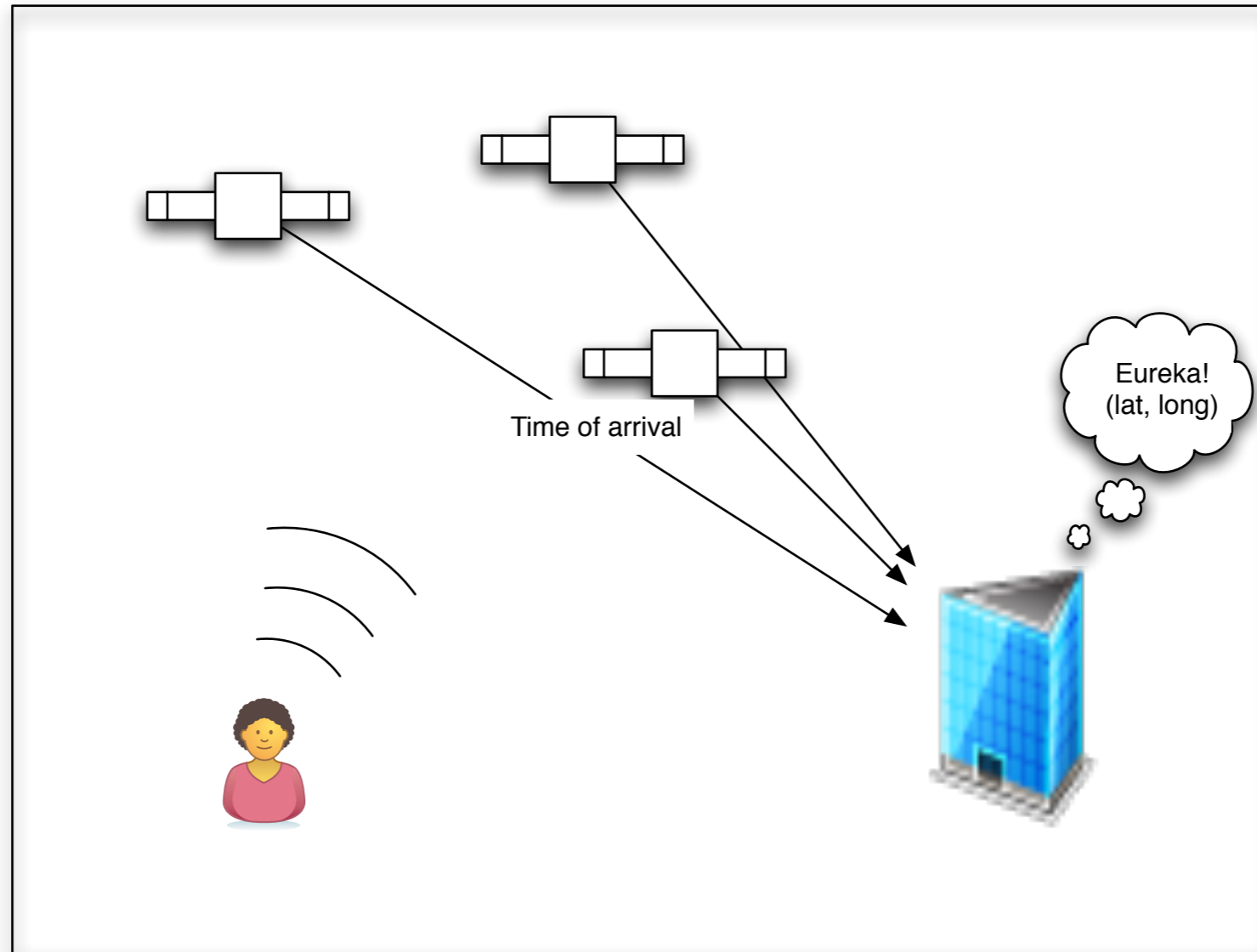


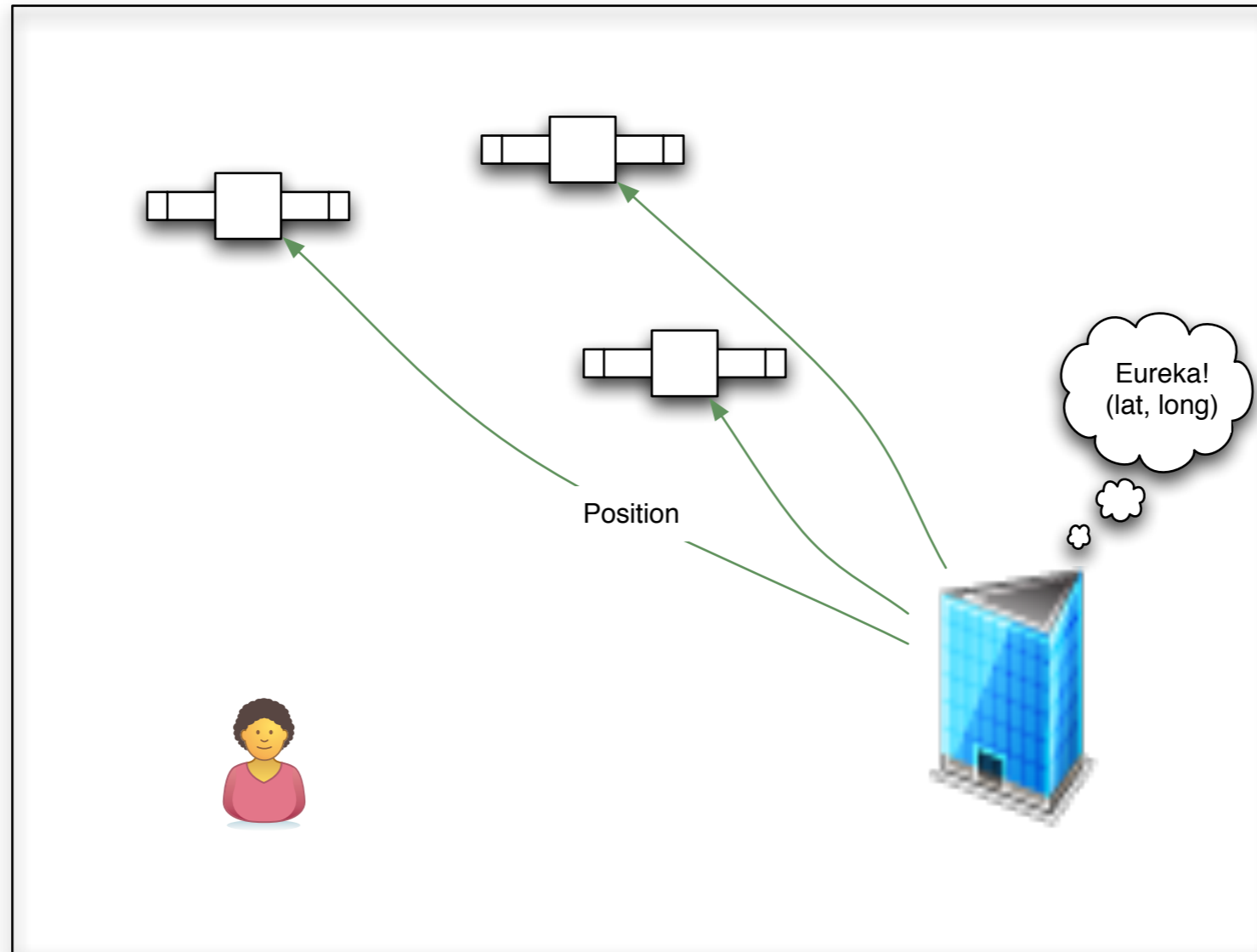
Bei-dou

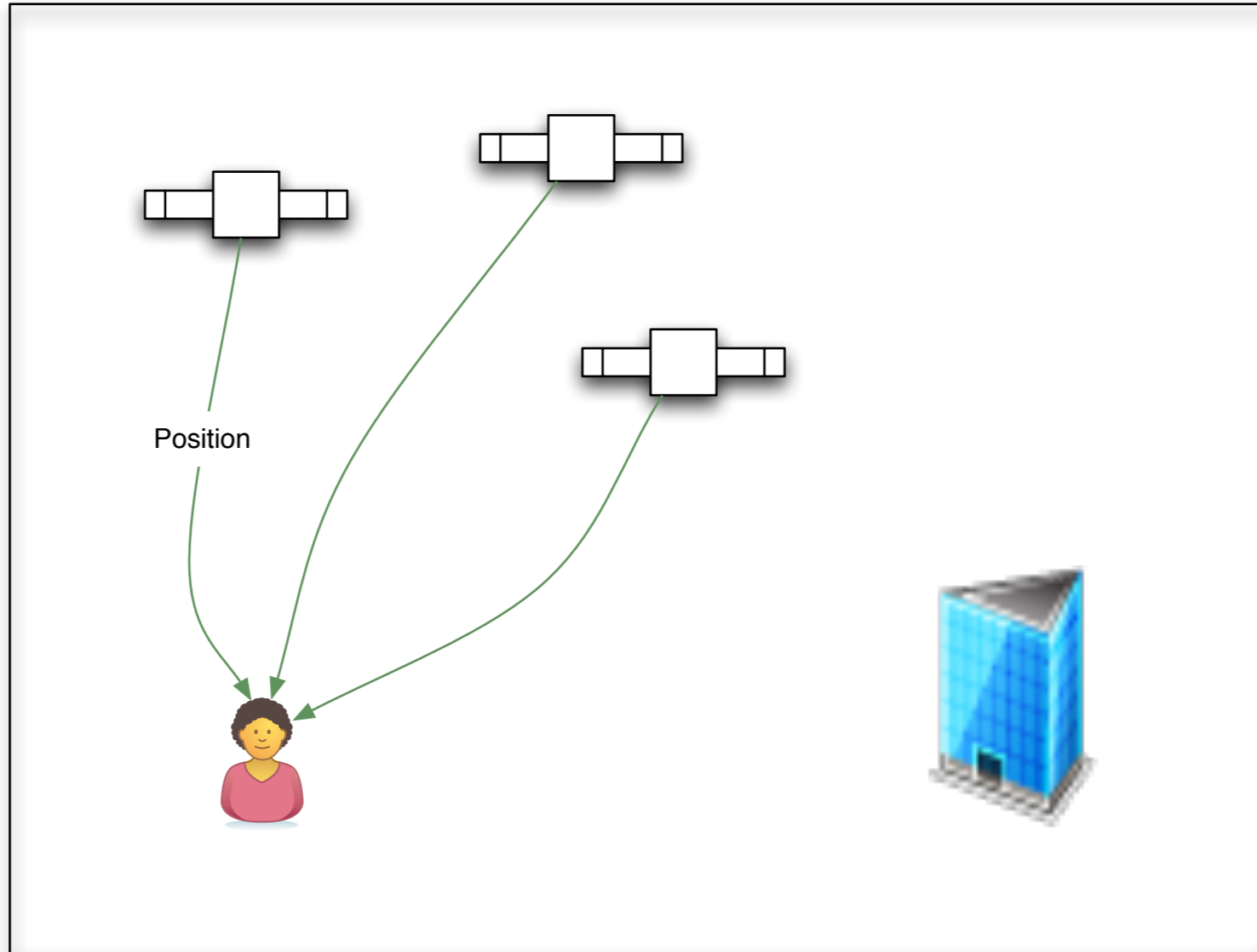


Bei-dou









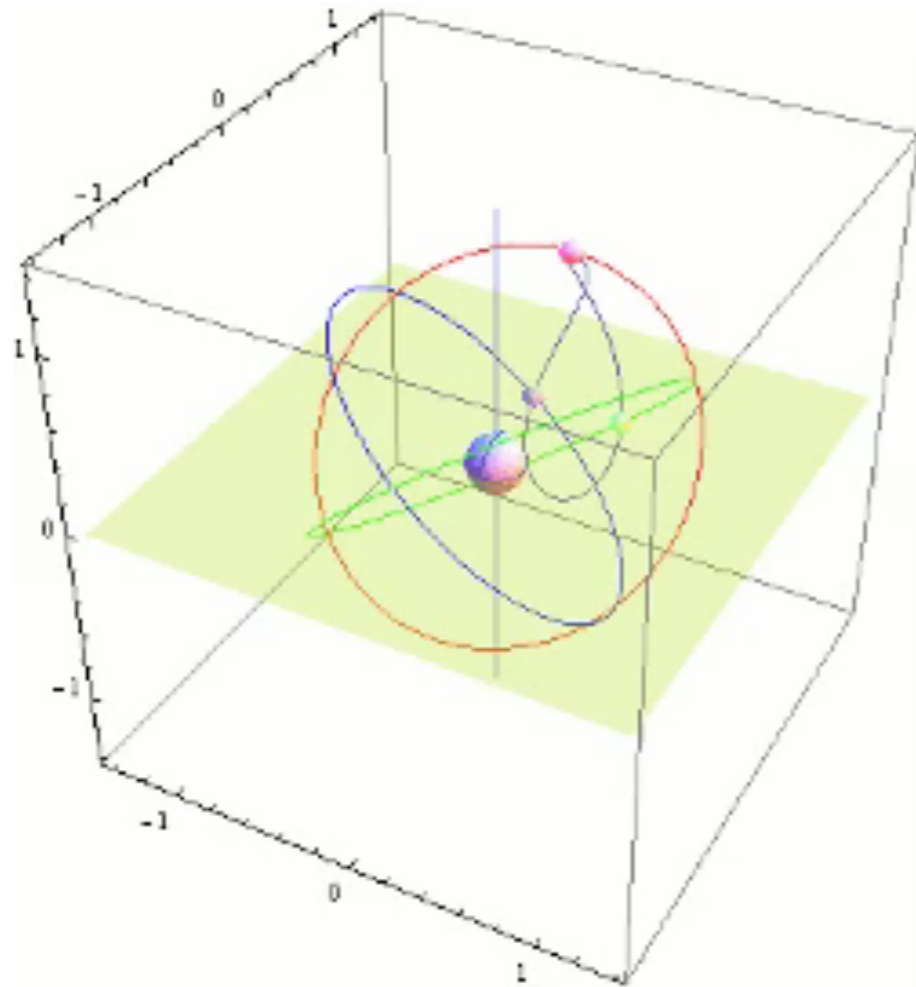
Intro to Location

- What are the implications of this design on
 - scalability of the system?
 - privacy of users?
 - security of users?
 - reliability?
 - implications on device?

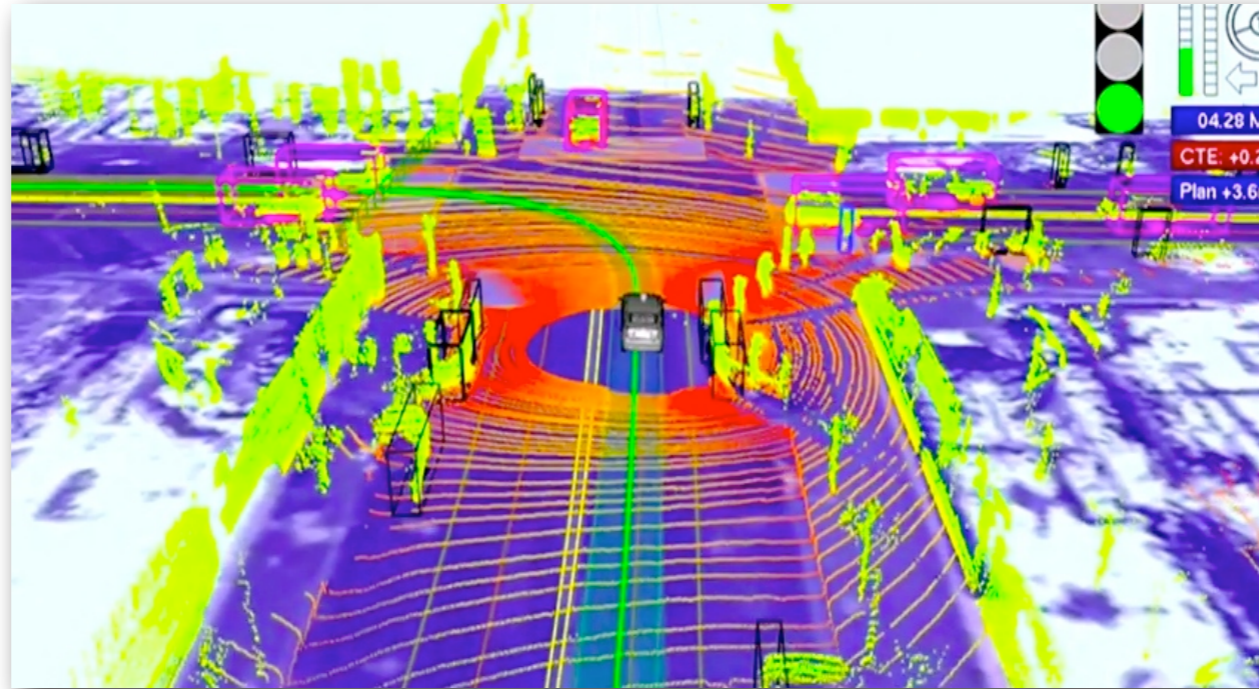


Global Location GPS

- The current and future of GPS
- Japanese Quasi-Zenith System



Google's self-driving car

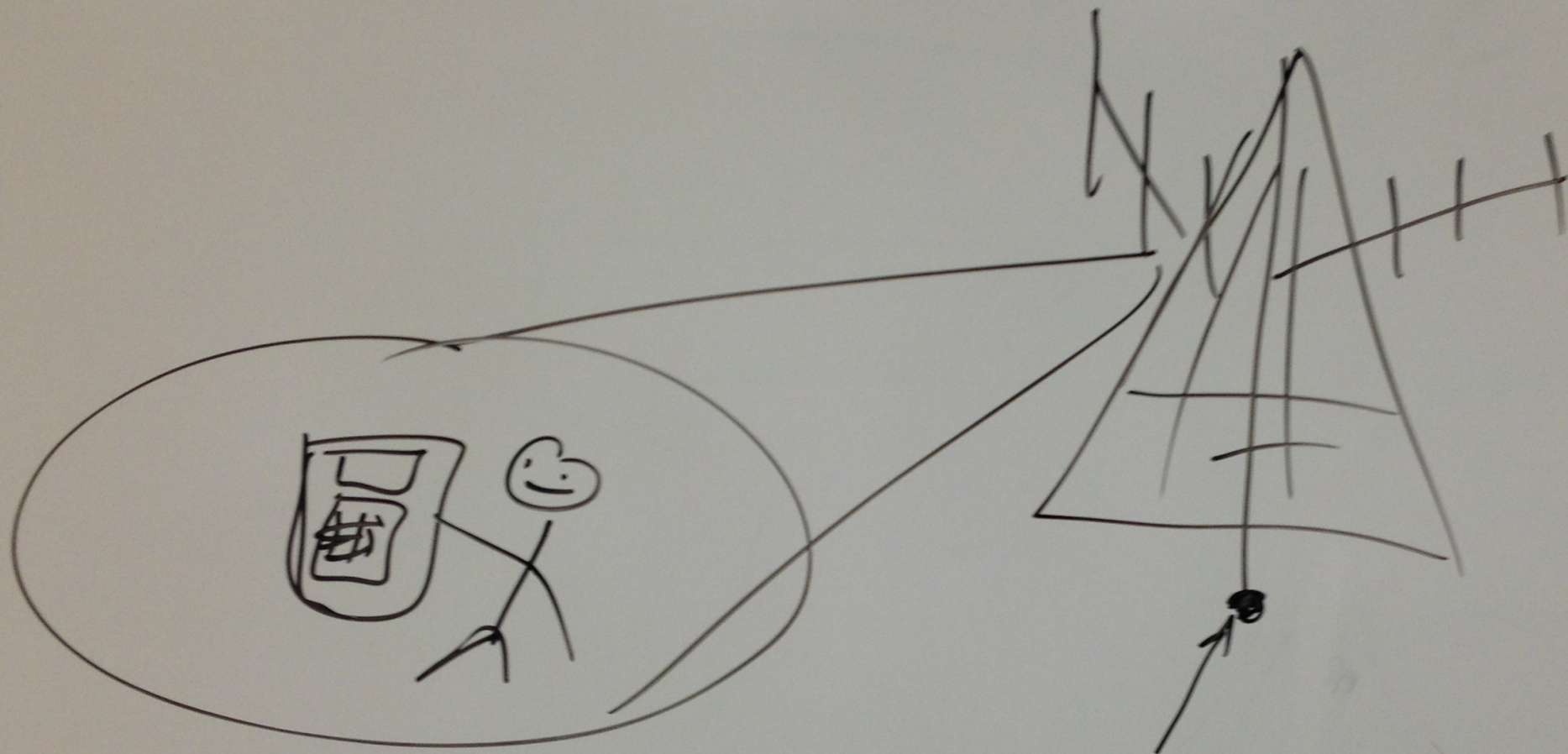


Two things seem particularly interesting about Google's approach. First, it relies on very detailed maps of the roads and terrain, something that Urmson said is essential to determine accurately where the car is. Using GPS-based techniques alone, he said, the location could be off by several meters.

How does a phone find your location?

- “Real” GPS
- “Assisted” GPS
 - Help with “Real” GPS
 - Send your position
 - Cell-tower based localization
- WiFi based localization
- IP based localization
- What are the properties of each?
- What are other crazy ideas of how to figure out your location?



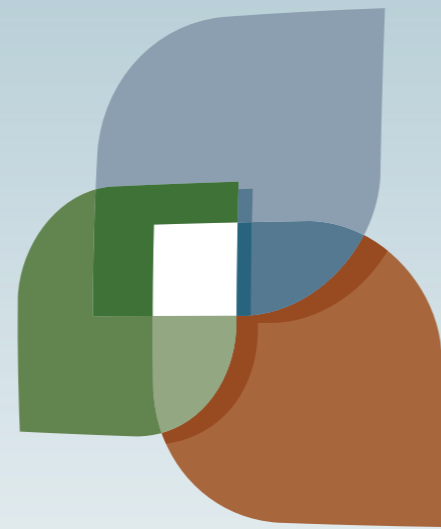


NO GPS
RELIES ON TELECOM

What's the difference between DGPS and A-GPS?

- DGPS
 - Requires a special receiver, a compatible tower, calculates position on receiver, provides very high accuracy
- Cell-tower positioning
 - Doesn't require GPS on phone, requires a cooperating cell-tower, position is calculated on tower, sent to phone
- A-GPS
 - Requires GPS on phone, Uses cell-tower to hot-start receiver GPS, requires cooperating tower, requires cooperating phone, standard accuracy
- All require tower to know where it is





L U C I

