uBike
Basic Idea

- Create a new experience of bike riding.
  - Beyond a traditional “bike transportation” experience
  - Green, Healthy, Social, Collaborative, Safe, Convenient, Mobile, Fun
  - More?
- Start from the NTU campus
Experience Opportunities

- **Green**
  - Persuasive technologies
    - Awareness (education) on environmental impact of transportation choice.

- **Healthy**
  - Persuasive technologies
   - Awareness on the health benefit

- **Social & Collaboration**
  - Localization system
  - Ad-hoc / sensor networking
    - Social riding (togetherness and connectedness of bikers on the road)

- **Fun**
  - Game?

- **Mobile**
  - Ad-hoc / sensor networking
  - Localization system
  - Public display
    - Location-based ads & messages
    - Mobile environment sensing platform
    - Green awareness to the public

- **Safety**
  - Location tracking
  - Ad-hoc / sensor networking
    - Avoid theft
    - Collaborative (horde) riding
    - Awareness on nearby cars & dangers

- **Convenience & Sharing**
  - Shared bikes
uBike HW Platform

- GPS or WiFi localization
- Digital display
- Sensor & ad-hoc networking
- Camera, microphone, or other sensors
- Accelerometer
- Bio-sensors (on the bike handles)
- Cell phone docking
Related Work on uBike

Lafree Bike From Giant / Taiwan
BikeNet (Darmouth/Columbia, Sensys 2007)

- iPod/Nike -> Bike
- Disconnected operation
- Cyclist performance/fitness measurement
- Environment/Experience mapping
- Long term performance trend analysis
- Data collection & local presentation
- Data query & remote presentation

Sensing
- Accelerometer
- Thermistor
- Photodiode
- Microphone
- Orientation
- GPS
- CO2
- GSR
Garmin Edge 305

“Take your ride to the next level with Edge 305, Garmin's GPS-enabled personal trainer and cycle computer. With a wireless heart rate monitor and speed/cadence sensor, Edge 305 will help you achieve your personal best.”
CiCloSport

- Now professional-grade calorie-consumption/fat-burning/wattage/power output functionality—not to mention the sophisticated training/trending/analysis that goes with it—is available to cyclists everywhere. Without cannibalizing your ride. On the new HAC 5, the initials stand for Heartrate/Altitude/Cadence. But that’s just a fraction of what it does. Add in every feature you’ve ever seen on a cyclo-meter. And with that, you’ve only scratched the HAC 5’s scratch-resistant surface.
Smart Cycle  (Fisher-Price)
The Iron Horse  (Chalmers, NordiCHI 2002)

- Transfer horse behaviors to bike
  - Bike snorts, greets, different speeds, ...
- Simulate fantasy
Summer plan

- Explore User Needs (context mapping)
- Prototype
  - bike + sensors
    (Accelerometer, GPS, WiFi, Camera...)
We Need you

- 對 Bike 有興趣
- 暑假想做研究
- 會寫程式
- 耐操