

Design Review 3

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Instrumented Bike Share Team 1

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Introduction

Client: Dr. Chun-Hsing Ho

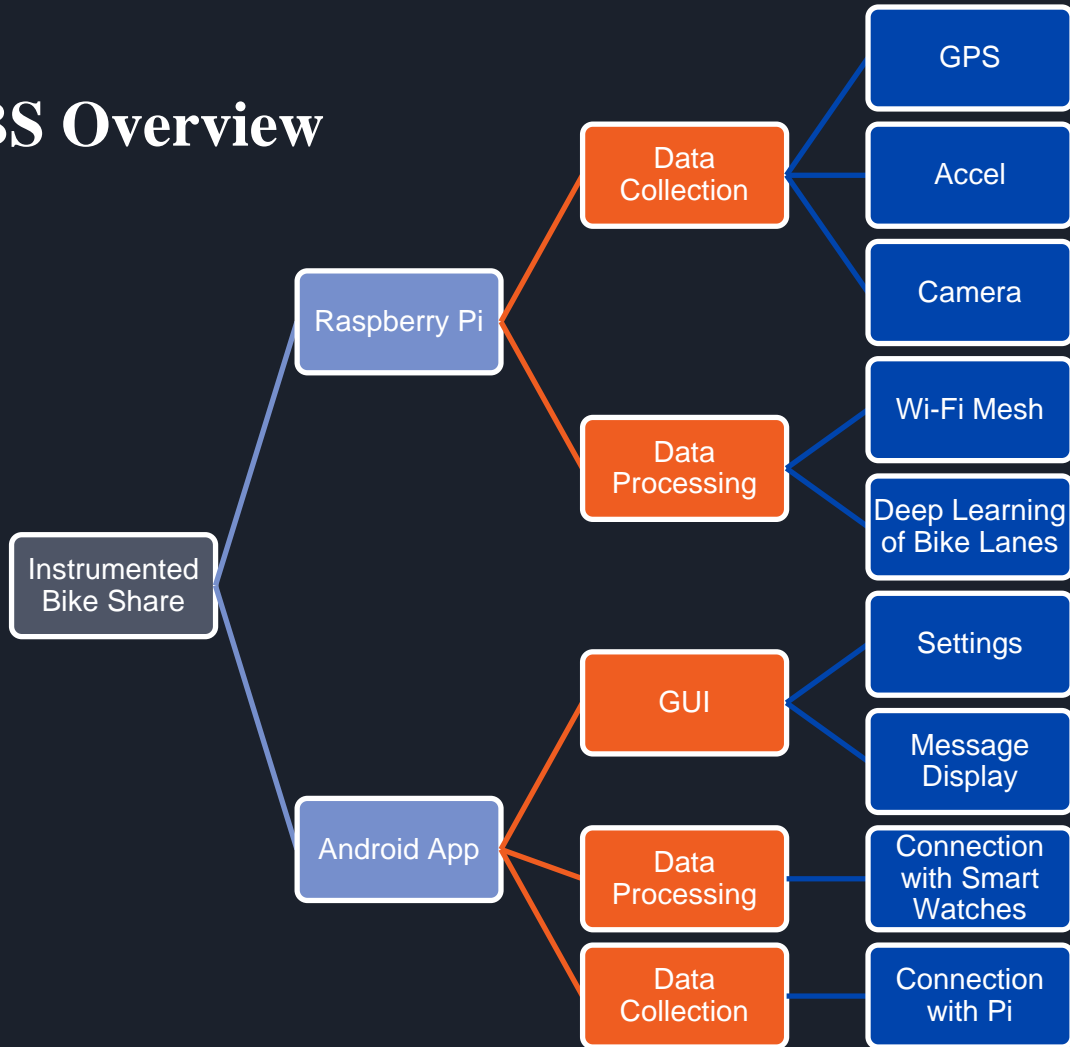
- Civil and Environmental Engineering
- MS, National Kaohsiung University of Applied Sciences, Taiwan MPA (airport operations), University of Montana-Missoula
- Ph.D., University of Utah

Mentor: Dr. Kyle Winfree

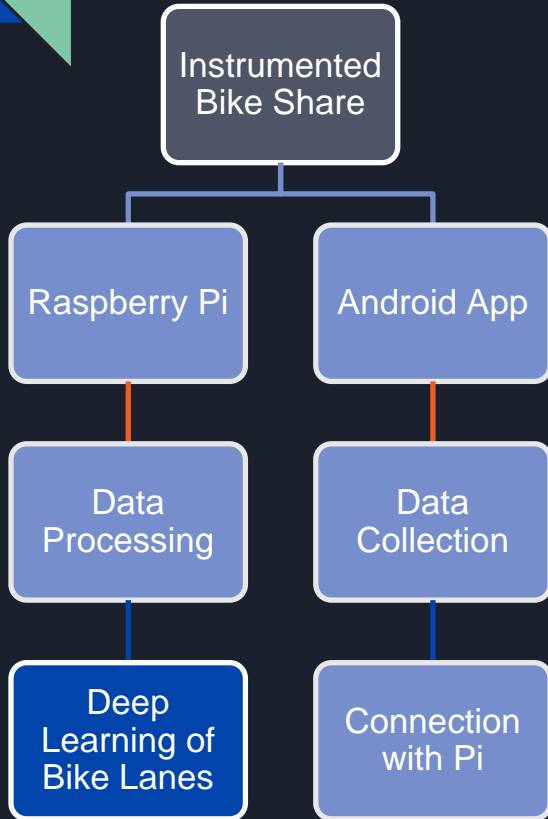
- School of Informatics, Computing, and Cyber Systems
- Ph.D., Biomechanics and Movement Science, University of Delaware
- MSE, Robotics, University of Pennsylvania BS, Physics, Northern Arizona University

GTA: Demetria Shepherd

WBS Overview



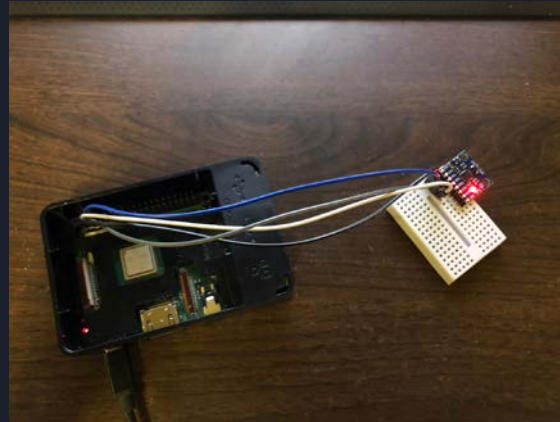
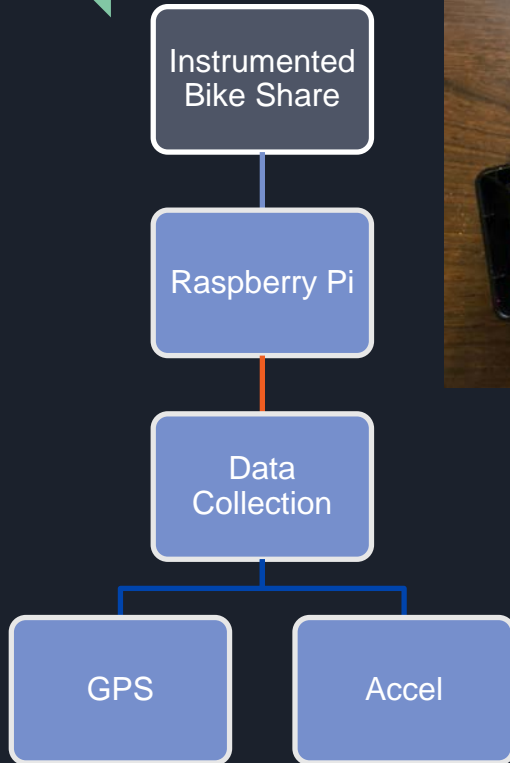
WBS: Guoyu Chen



Deliverable:

- Running time < 1s
- Automatically store files and share, local network and Android devices

WBS: Pengkai Fang



```
pi@raspberrypi:~$ sudo python gyro.py
Gyroskop
-----
gyroskop_xout:  -385  skaliert:  -3
gyroskop_yout:  -137  skaliert:  -2
gyroskop_zout:  -192  skaliert:  -2

Beschleunigungssensor
-----
beschleunigung_xout:  680  skaliert:  0.04150390625
beschleunigung_yout:  -336  skaliert:  -0.0205078125
beschleunigung_zout:  17000  skaliert:  1.03759765625
X Rotation:  -1.1313822969
Y Rotation:  -2.2901632439
```

```
pi@raspberrypi:~$ sudo python gyro.py
Gyroskop
-----
gyroskop_xout:  -367  skaliert:  -3
gyroskop_yout:  -168  skaliert:  -2
gyroskop_zout:  -205  skaliert:  -2

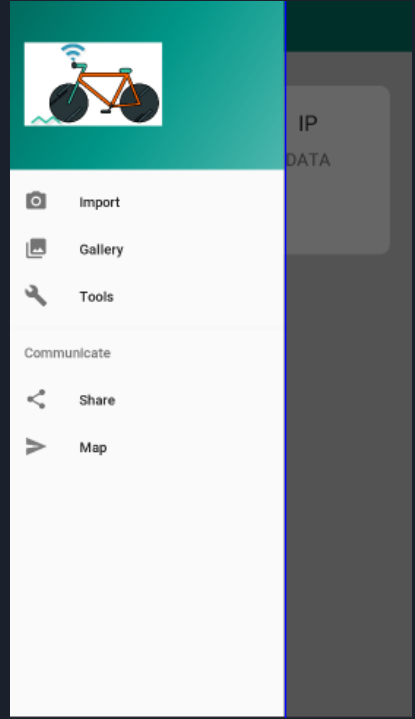
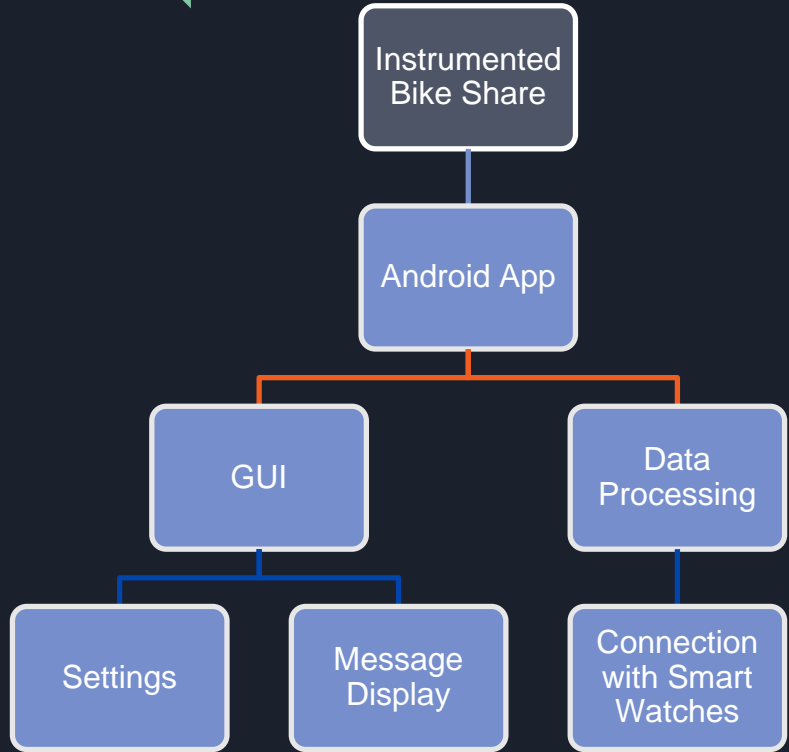
Beschleunigungssensor
-----
beschleunigung_xout:  3540  skaliert:  0.216064453125
beschleunigung_yout:  -2008  skaliert:  -0.12255859375
beschleunigung_zout:  16692  skaliert:  1.01879882812
X Rotation:  -6.71168804512
Y Rotation:  -11.8904823889
```

WBS: Pengkai Fang

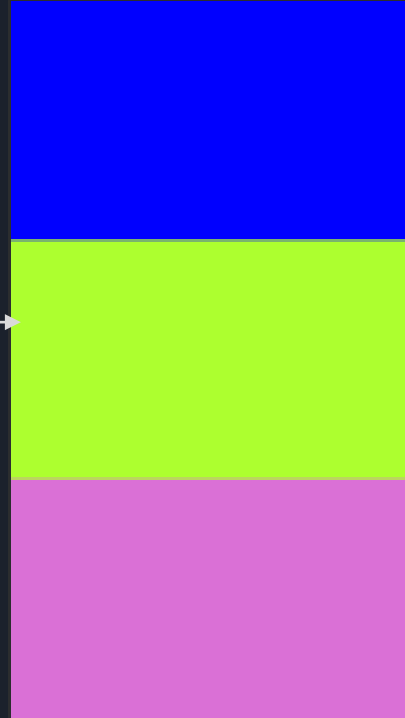
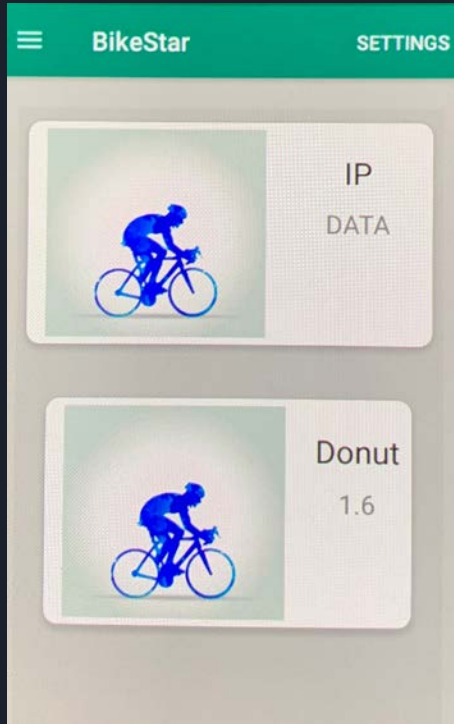


```
$GPRMC,031739.00,A,3510.70838,N,11139.30411,W,0.604,,260219,,A*6E  
$GPVTG,,T,,M,0.604,N,1.119,K,A*29  
$GPGGA,031739.00,3510.70838,N,11139.30411,W,1,06,1.75,2066.5,M,-25.2,M,,*54  
$GPTXT,01,01,01,NMEA unknown msg*58  
$GPGSA,A,3,06,02,19,24,17,12,,,,,,,,,3.56,1.75,3.10*0C
```

WBS: Ai Zhang



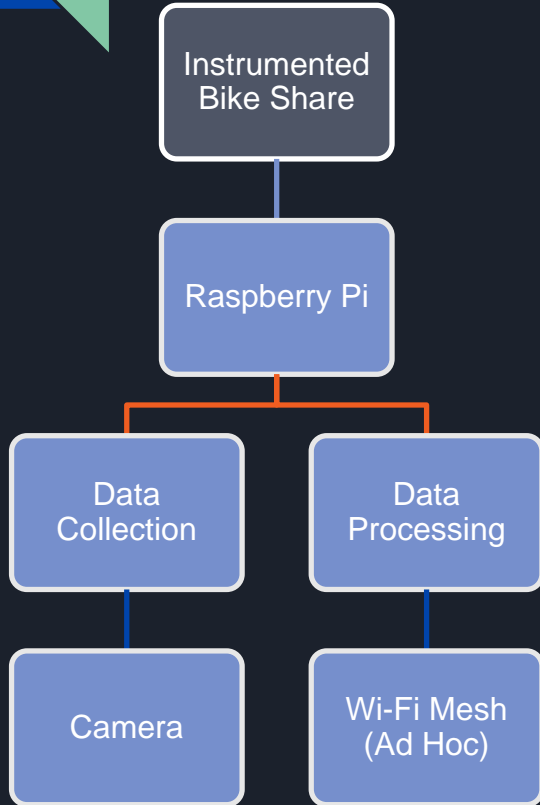
WBS: Ai Zhang



Deliverable:

The main screen can show the basic information;
The “setting” can skip to the content part;
Users can record the road condition according to the camera;
Users can get information through our APP

WBS: Jingwei Zhang



```
pi@raspberrypi: ~  
File Edit Tabs Help  
Tx-Power=31 dBm  
Retry short limit:7 RTS thr:off Fragment thr:off  
Encryption key:off  
Power Management:on  
eth0 no wireless extensions.  
pi@raspberrypi:~ $ ping 172.18.30.2  
PING 172.18.30.2 (172.18.30.2) 56(84) bytes of data.  
From 172.18.30.3 icmp_seq=1 Destination Host Unreachable  
From 172.18.30.3 icmp_seq=2 Destination Host Unreachable  
From 172.18.30.3 icmp_seq=3 Destination Host Unreachable  
From 172.18.30.3 icmp_seq=4 Destination Host Unreachable  
From 172.18.30.3 icmp_seq=5 Destination Host Unreachable  
From 172.18.30.3 icmp_seq=6 Destination Host Unreachable  
^C  
--- 172.18.30.2 ping statistics ---  
8 packets transmitted, 0 received, +6 errors, 100% packet loss, time 7296ms  
pipe 4  
pi@raspberrypi:~ $ sudo /etc/network/interfaces  
sudo: /etc/network/interfaces: command not found  
pi@raspberrypi:~ $ sudo nano /etc/network/interfaces  
pi@raspberrypi:~ $ sudo nano /etc/dhcpd.conf  
pi@raspberrypi:~ $
```

WBS: Jingwei Zhang

```
GNU nano 2.7.4 File: /etc/dhcpd.conf
#interface eth0
#static ip_address=192.168.0.10/24
#static ip6_address=fd51:42f8:caae:d92e::ff/64
#static routers=192.168.0.1
#static domain_name_servers=192.168.0.1 8.8.8.8 fd51:42f8:caae:d92e::

# It is possible to fall back to a static IP if DHCP fails:
# define static profile
#profile static_eth0
#static ip_address=192.168.1.23/24
#static routers=192.168.1.1
#static domain_name_servers=192.168.1.1

# fallback to static profile on eth0
#interface eth0
#fallback static_eth0

interface wlan0
    static ip_address=172.18.30.3/24
```

```
<interfaces>
File Edit Search Options Help
# interfaces(5) file used by ifup(8) and ifdown(8)

# Please note that this file is written to be used with dhcpd
# For static IP, consult /etc/dhcpd.conf and 'man dhcpd.conf'

# Include files from /etc/network/interfaces.d:
source-directory /etc/network/interfaces.d

allow-hotplug wlan0
iface wlan0 inet manual
    wireless-essid ad-hoc
    wireless-mode ad-hoc
    wireless-channel 3
```

```
File Edit Search Options Help
#static ip_address=192.168.0.10/24
#static routers=192.168.0.1
#static domain_name_servers=192.168.0.1 8.8.8.8 fd51:42f8:caae:d92e::

# It is possible to fall back to a static IP if DHCP fails:
# define static profile
#profile static_eth0
#static ip_address=192.168.1.23/24
#static routers=192.168.1.1
#static domain_name_servers=192.168.1.1

# fallback to static profile on eth0
#interface eth0
#fallback static_eth0

interface wlan0
    static ip_address=172.18.30.2/24
```

```
pi@raspberrypi ~$
File Edit Tabs Help
GNU nano 2.7.4 File: /etc/network/interfaces Modified
# interfaces(5) file used by ifup(8) and ifdown(8)

# Please note that this file is written to be used with dhcpd
# For static IP, consult /etc/dhcpd.conf and 'man dhcpd.conf'

# Include files from /etc/network/interfaces.d:
#source-directory /etc/network/interfaces.d
auto eth0
iface eth0 inet dhcp

auto wlan0
iface wlan0 inet manual
    wireless-essid ad-hoc
    wireless-mode ad-hoc
    wireless-channel 3

File Name to Write: /etc/network/interfaces
M-G Get Help M-D DOS Format M-A Append M-S Backup File
M-C Cancel M-X Mac Format M-P Prepend M-T To Files
```

Summary

Instrumented Bike Share

Raspberry Pi

Android App

Data Collection

Data Processing

GUI

Data Processing

Data Collection

GPS

Accel

Camera

Wi-Fi Mesh

Deep Learning of Bike Lanes

Settings

Message Display

Connecti on with Smart Watches

Connecti on with Pi

100%

90%

80%

70%

60%

0%

Thanks for your listening!
Q & A

