

CyWee Motion Fusion Solution

(Middleware only)

Confidential (Internal Use Only)

Limited Release

Normal

CyWee Handset Total Solution

- CyWee motion middleware supporting Gyro, Accelerometer and magnetic sensors
- CyWee patented inclined gyro to simulate from 2-axis to 3-axis gyro output
- Provide sensor fusion motion library and API
- Other content provided by CyWee
 - CyWee games(console, online game)
 - Any existing PC game's motion mapping
 - Any existing cell phone's games motion mapping
 - New user interface on handset
 - Mobile console and mobile dongle for real time video transmission from the handset to TV

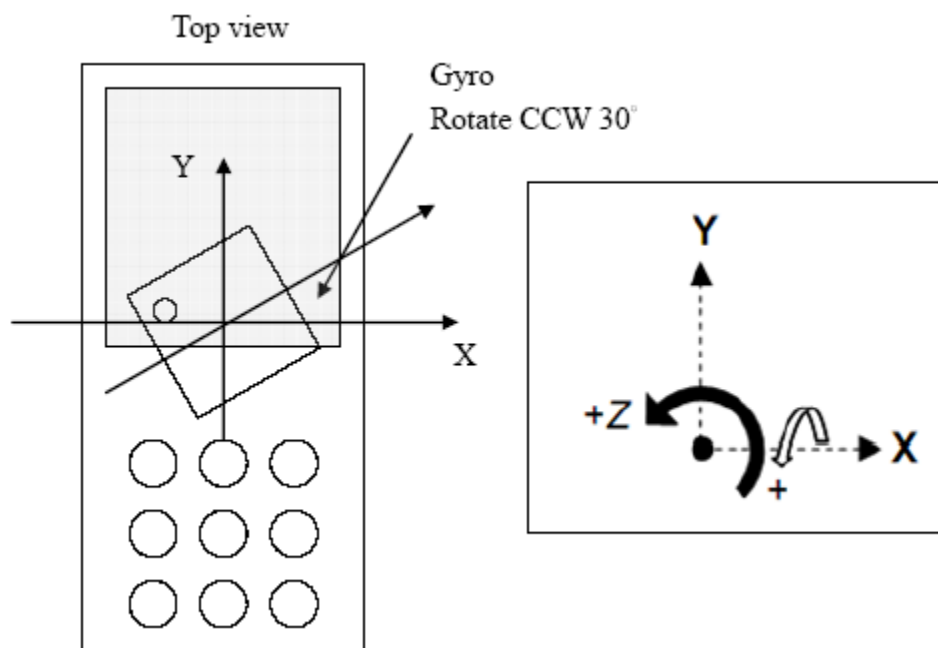


Fig. 1 Block diagram on handset

Easy for Software Integration

- CyWee library for handset solution is O.S independent
- All pure C/C++ code
- Easily to integrate with other sensors: ex: G sensor, Gyro and MR sensor...etc. through I²C bus
- Customized motion recognition API for specific application on handset

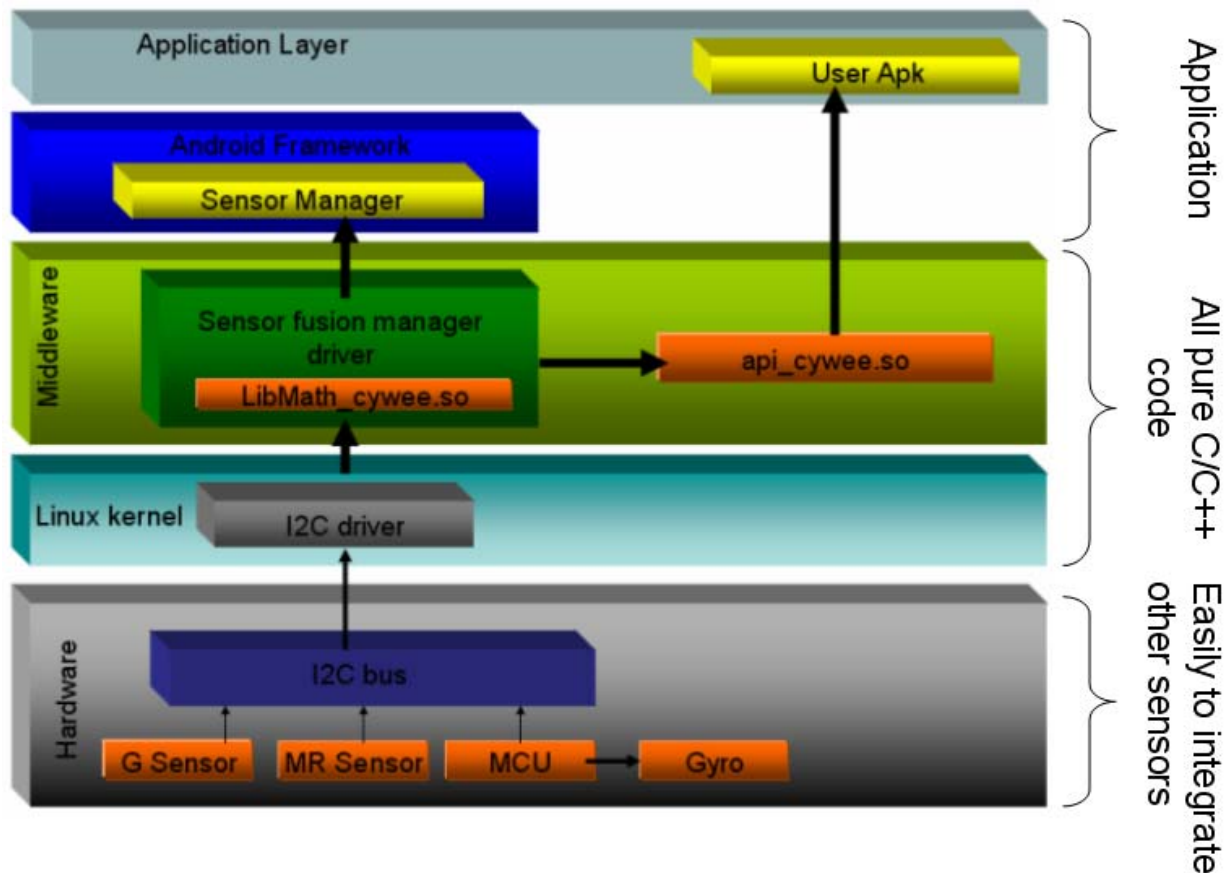


Fig. 2 Example: CyWee sensor fusion total solution on Android platform

CyWee Motion Recognition Tech.

- **Usage**

The CyWee motion recognition technology can provide the motion recognition result by using a 3-axis accelerometer (Ax, Ay, Az), a 2-axis gyroscope (Gwy, Gwz) and a 3-axis (Mx, My, Mz) magnetic sensor.

The phone coordinate is shown in Figure 1:

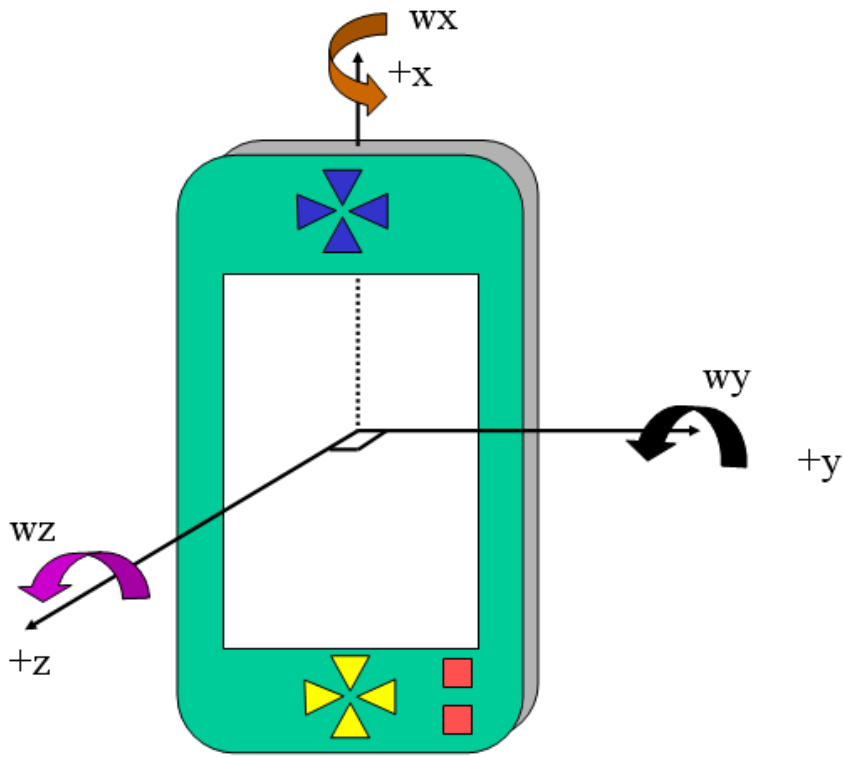


Fig. 3 Coordination of the phone

3-axis accelerometer (A_x, A_y, A_z) contains A_x, A_y and A_z sensing axes. Each sensing axis aligns to the phone coordinate. The A_x 's "x" means aligning to phone coordinate $+x$. The A_y 's "y" means aligning to phone coordinate $+y$. The A_z 's "z" means aligning to phone coordinate $+z$. The gyroscope's G_wy means aligning to phone coordinate $+wy$. G_wz means aligning to phone coordinate $+wz$. The magnetic sensor's M_x means aligning to phone coordinate $+x$. M_y means aligning to phone coordinate $+y$ and M_z means aligning to phone coordinate $+z$.

● Protocol

All sensors' rawdata can be got from the CyWee library. These data's format maybe become different from the original rawdata got directly from each sensor through I2C interface.

The rule of usage can be found as blow:

1. CyweeDataTypes.h
2. CyweeApi.h

CyweeDataTypes.h contains the parameters used in the program and the CyweeApi.h contains the functions definition of all the algorithms.

● API introduction

CyWee library is a library of algorithm to detect the human motion and recognize it as a special status to interact with games. By this library, you can connect to the API with games on phone. You can also send the sensor data to PC side to use the phone as an air mouse and as a game controller to play the PC game.

This API of CyWee library is in support of the usage of five modes. They are *Rawdata mode*, *Sports mode*, *flying mode*, *racing mode* and *PC application mode*.

Rawdata mode:

In this kind of API, CyWee will provide the API with all the sensors rawdata. It contains accelerometer, gyroscope and magnetic rawdata.

Sports mode:

In this kind of API, CyWee will provide the motion recognition results due to the motion of waving the phone in several directions. The motion can be as Figure 2 showing:

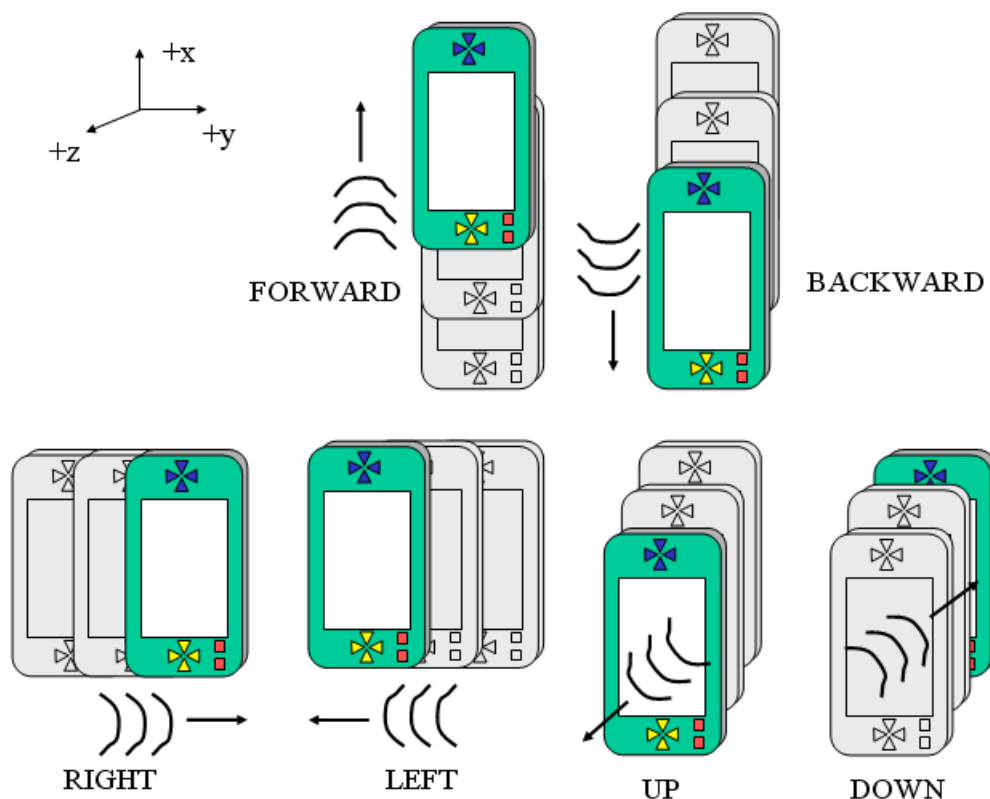


Fig. 4 Sport mode

Flying mode:

In this mode, CyWee will provide with Roll, Pitch and Yaw three absolutely angle and relative Yaw and

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