

# GoldFish: Real-world GUI Framework for Android

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## ABSTRACT

We introduce a JavaScript framework for developing “*Real-World GUI*” using an Android phone equipped with an NFC reader. Using the NFC reader and motion sensors at the same time, users can control various parameters by moving the phone on NFC tags, just like using a mouse for controlling menus and scroll bars on a computer display. All the control programs are written in JavaScript and put on the Web so that users do not have to install different Android programs for different tags.

## INTRODUCTION

Although we can easily control data and parameters using various GUI widgets on a PC and a tablet, we cannot use standard GUI techniques without a graphic display and a pointing device. We propose using Android phones and NFC tags for performing GUI operations in the real world without using standard pointing devices, based on the same idea as the FieldMouse system[1].

We put NFC tags where we want to control data by GUI actions. If a user wants to control the sound volume of a TV from the dining table, he puts an NFC tag on the table, and when he puts his Android phone close to the tag, a special application on Android is automatically launched and recognizes the user’s subsequent actions to control the TV; e.g. the application can detect the rotation of the phone and wirelessly tell the TV to modify the sound volume based on the angle.

We have created the *GoldFish* framework to enable such GUI operations just by writing a simple JavaScript code on the Web. When an Android phone recognizes an NFC tag, the GoldFish application on Android is launched and tries to display a Web page [http://ubif.org/\(NFC-ID\)](http://ubif.org/(NFC-ID)) on the browser. If a user’s Web page is tagged to the ID beforehand, the user’s page is displayed instead. The user can then use arbitrary JavaScript programs to read the sensor data of Android and perform GUI actions based on the data.

## EXAMPLES

Figure 1 shows how we can copy/paste data between a PC and an Android phone. An NFC tag is put on the edge of the PC screen, and when a user put his Android phone on the tag, a “goldfish” icon appears on the Android screen. If he twists the phone clockwise, the data on the PC is copied to the phone, and the data on the phone is pasted to the PC if he twists the phone counterclockwise.

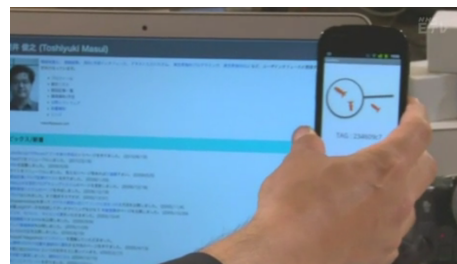


Figure 1: Real-world copy/paste.

Figure 2 shows a real-world GUI program which uses the value given from the *goldfish* object.

```
<script src='jquery.js'></script>
<script src='goldfish.js'></script>
<script type="text/javascript">
var angle = 0;
var int_id = setInterval(
function (){
    var gyro = goldfish.gyroscope();
    angle += gyro.z * 3;
    $("#turn").rotate(parseInt(angle));
    $.ajax(
        // do actions based on angle
    );
}, 50);
</script>
```

Figure 2: A JavaScript code for detecting rotation.

## REFERENCES

1. Toshiyuki Masui and Itiro Siio. Real-world graphical user interfaces. In *Proceedings of the International Symposium on Handheld and Ubiquitous Computing (HUC2000)*, pages 72–84, September 2000.