

西南民族大学

本科生毕业设计(论文)

题目：智能手表的非接触式备择交互模式的设计

Designing Alternative Contact-free Control Modalities for Smart Watches

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摘要

本文设计了一套用于智能手表上的择备交互模式，能够释放双手。

关键词 智能手表; 手势交互

Abstract

This paper try to introduce a alternative interaction on smart watches, which can be contact-free.

Keywords Smart Watches; Gesture Interaction

第一章 概述

1.1 目的、背景及意义

1.2 相关工作

第二章 手表上交互

在 Apple Watch 中，由于触摸屏的存在，大部分手表中的交互方式沿袭自带有触摸屏幕的智能手机。为了对手表中的交互方式进行备择设计，我们必须分析并且明确在 Apple Watch 中现存的交互方式及其优缺点。

2.1 传统交互

2.1.1 点击

2.1.2 滑动

2.2 特有交互

2.2.1 Digital Crown

2.2.2 Force Touch 和 Taptic Engine

2.3 其他交互

2.3.1 侧面按钮

2.3.2 常规手势

2.3.3 语音控制

第三章 非接触备择设计

3.1 相关工作

3.2 技术可行性

3.3 交互方法

3.3.1 点击

3.3.2 滑动

3.3.3 Digital Crown

3.3.4 Force Touch 仿真

对 Force Touch 进行仿真, 我们需要定义两个常量: DELAY 表示触发 Force Touch 的时间延时。DURATION 表示 Force Touch 从最小值到最大值的持续时间。其中 DELAY 的值为 200, DURATION 则为 1000, 两者单位为毫秒 (ms)。

设在一次按压中的按压时间为 t_{press} , 则 Force Touch 可以使用公式 3.1 进行模拟:

$$v_F = \begin{cases} \frac{t_{\text{press}} - \text{DELAY}}{\text{DURATION}} & \text{if } t_{\text{press}} - \text{DELAY} < \text{DURATION} \\ 1 & \text{Otherwise} \end{cases} \quad (3.1)$$

3.3.5 其他

第四章 系统设计

4.1 总体设计

4.2 框架选型

4.3 架构设计

4.4 演示程序

第五章 编码实现

5.1 环境搭建

5.2 关键编码

5.2.1 桌面端

5.2.2 服务端

5.2.3 手表端

第六章 用户调研与测试

6.1 用户调研

6.2 测试方法

第七章 进一步工作

7.1 缺陷

讲解技术上的困难。

7.2 改进方向

讲解可能的改进方向。

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