CLEAN ROOM ID SYSTEM

Schafer's Wafers

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Wait! Who are these people?

Problems

- Wearing coveralls
  - Hard to ID people from outside
- Swiping into the cleanroom
  - No visible list of current users
  - No way to check usage statistics ($/hour)
- Users should not process alone
  - How do you know another person is in the cleanroom?
- Email list serve
  - No concise list of non-functional systems

Proposed Solution

- Prof. Seabaugh suggested creating a display system
  - IDs current cleanroom users
  - Shows individuals' time of use (total, weekly, and session)
  - Posts machine statuses
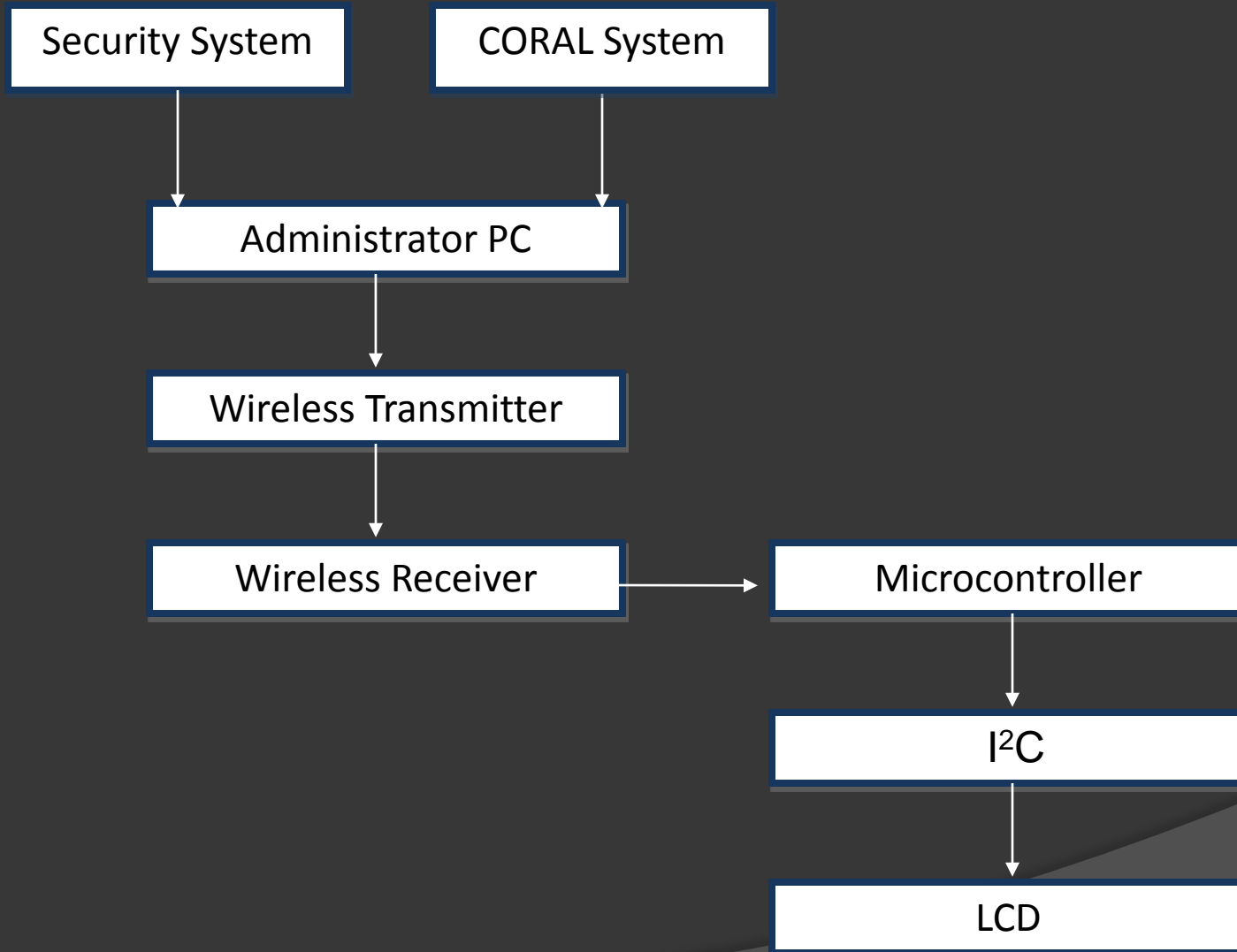 - Shows machine statistics (top users, usage time)

http://www.nsec.ohio-state.edu/teacher_workshop.html

Features

- Display visible from both the lobby and cleanroom
- Rotates displays
  - Current users
  - Top users of the week
  - Machine statuses
  - Pictures and research information
- Display can be modified by administrator
  - Allows display to be modified for special occasions
  - Add new research projects

System Overview

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┌──────────────────┐        ┌──────────────────┐
│ Security System  │        │  CORAL System    │
└──────────────────┘        └──────────────────┘
         │                           │
         ▼                           ▼
      ┌──────────────────────────────┐
      │        Administrator PC       │
      └──────────────────────────────┘
                     │
                     ▼
      ┌──────────────────────────────┐
      │      Wireless Transmitter     │
      └──────────────────────────────┘
                     │
                     ▼
      ┌──────────────────────┐      ┌──────────────────────┐
      │   Wireless Receiver   │ ───▶ │    Microcontroller    │
      └──────────────────────┘      └──────────────────────┘
                                                │
                                                ▼
                                     ┌──────────────────────┐
                                     │         I²C           │
                                     └──────────────────────┘
                                                │
                                                ▼
                                     ┌──────────────────────┐
                                     │         LCD           │
                                     └──────────────────────┘
```

Technologies

- One or two LCD screens
- Two Zigbee wireless chips (transmitter and receiver)
- Computer program that gathers information from the CORAL system and RF ID security system
- Microcontroller to interface with the Zigbee chip (Memory, speed, power, price?)
- Interface between microcontroller and LCD (I^2C)

Engineering Content

- Learn how the RF ID and CORAL systems work
  - How to access current users
  - Which machines are being repaired
- Write program that integrates information from both systems as well as the administrator specifications to create the data for the display
  - Programming language (C++, Java, Perl?)
  - How to import users from security system
  - How to prepare information in a form that allows it to be displayed on LCD
  - How often to refresh display information

Engineering Content (Cont'd)

- Transferring information from computer to Zigbee Transmitter
- What medium for transmission?
  - Zigbee, Wireless Internet, or something else
- Information from Zigbee Receiver to Microcontroller
  - Interface needed?
- Microcontroller to LCD
  - Interface Type? Possibly I^{2}C

Current Concerns

- How will the LCD/Microcontroller be powered?
  - Cord running to outlet? (unsightly)
  - Batteries? (battery lifetime/cost)
- Mounting system for LCD/board?
- When will CORAL system be fully functional?
- What computer will program run on?
  - Will this program run constantly or intermittently?
- Will EE department supplement funding for a larger LCD screen?

Questions?

Thank You