

IPRO 343



**IMPROVING COMMUNICATION
IN NOISY AND DISTRACTING
ENVIRONMENTS**

Introduction



- **Previous Work**

- Worked to improve communications in a drive-thru environment.
- Developed white noise filter to improve order accuracy
- Recorded order accuracy increase of ~10%

- **Today**

- Broadening research opportunities
- Aim to improve communication in public, open environments

Introduction



Introduction



- Should you become aware of any suspicious items or parcels, on or about our facilities or trains; please alert an Amtrak or Metra employee immediately.

Statement of the Problem



- There are no standards for talker characteristics in Public Announcement Systems.
 - Consequently common Public Announcement systems can often be difficult to understand
- Low Speech Intelligibility
 - - What is speech intelligibility?
 - - What factors can degrade intelligibility?
 - ✦ Focus: words/minute, pitch, duration
 - - How can we maximize speech intelligibility?

Goals



- **Research Objective:**

- Recommend standards for talker characteristics in Public Announcement systems

- **Project Goals:**

- Record
- Analyze
- Design
- Administer
- Compile

Team Organization



Research Objective:
Recommend standards for talker characteristics in Public Announcement systems

Preparation Phase

Project Plan/IRB

Recording

Analyzing

Midterm
Presentation

Experiment Phase

Recruitment

Materials

Administration

Culmination Phase

Final Report

I PRO Day
Exhibit

I PRO Day
Presentation

Team Organization



Preparation Phase

Project Plan/IRB
Hyemin Choi
Justo Moraga
Noravidhya Tanapura

Recording
Kevin Arnold
Brian Bjerke
Scott Justus
Shavanna Pinder

Analyzing
Jessie Bauer
Karen Hong
Justo Moraga
Noravidhya Tanapura

**Midterm
Presentation**
Jessie Bauer
Scott Justus
Crystal Reynolds

Team Organization



Experiment Phase

Recruitment

Jessie Bauer
Brian Bjerke
Karen Hong
Justo Moraga
Shavanna Pinder

Materials

Kevin Arnold
Hyemin Choi
Scott Justus
Justo Moraga
Noravidhya Tanapura

Administration

Kevin Arnold
Brian Bjerke
Hyemin Choi
Shavanna Pinder
Crystal Reynolds

Team Organization



Culmination Phase

I PRO Day Exhibit
Kevin Arnold
Hyemin Choi
Karen Hong
Noravidhya Tanapura

I PRO Day Presentation
Jessie Bauer
Brian Bjerke
Scott Justus
Crystal Reynolds

Final Report
Karen Hong
Shavanna Pinder
Crystal Reynolds

Progress



- Created sub teams and a working timeline
- 12 Recordings
- Analysis
- Literature review
- Draft of experiment
- NIH Ethics training and IRB clearance

Experiment



Major Obstacles To-Date



- Low quality PA recordings
- Equipment has weapon-like appearance
- Lack of linguistic training

Anticipated Major Challenges



- Recruitment
- Experimental design
- Interface development

Impact



- Public Address systems
- Disability services
- Consumer Products



Questions



Members of IPRO 343:

- Shavanna Pinder (ARCH)
- Hyemin Choi (ARCH)
- Justo Moraga (CE)
- Crystal Reynolds (PSYC)
- Noravidhya Tanapura (MMAE)
- Kevin Arnold (PS)
- Jessie Bauer (ECE)
- Brian Bjerke (CE)
- Scott Justus (BCPS)
- Karen Hong (ARCH)