



OpenComm is a realistic and intuitive audio conferencing system for Android

Alice talks to Bob and Susan in the main conference. She hears Bob on her left, and Susan on her right.

Alice moves Susan farther away from her, and Susan's voice becomes softer.

Alice wants to tell Bob a secret and creates a side chat with him. They can still hear Susan chatting away.

Alice and Bob return to the main conference. Susan didn't even notice they left.

Alice's location relative to Bob and Susan

Clicking this adds a new side chat

A side chat with colors indicating who's inside

Volume controls for all the chats

Alice can navigate back to the main conference

how it works

TECHNOLOGIES USED

User Interface: Java and Android emulator using Android Virtual Device (AVD)

XMPP: Backbone of the project. Used for connection, multi-user chat room management, and session negotiation. Implemented using the Asmack library.

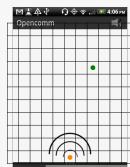
RTP: Standardized packet format for delivering audio. RTP is not included in Android 2.2, so we use our own implementation.

Jingle (extension of XMPP protocol): Used for multimedia audio session negotiation. Customized library.

Openfire server: Self-hosted solution with database and LDAP connectivity.

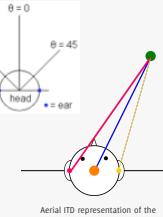
REGIONS

The conference space is divided up into regions 0-120, covering 110% of the available conference space. The center point of each user icon is used to determine which region. The interaural time delay (ITD) and volume difference for each region is calculated based on the region's center point.



ITD IMPLEMENTATION

- Read in short array of sound
- Make copies for left and right stereo channels
- Add ITD (short) either front or back of the sound source, depending on whether the sound source is coming from the left or the right
- Combine them to create a short array formatted for stereo output



INTERAURAL TIME DIFFERENCE (ITD)

The difference in time for the sound to reach the left ear versus the right ear.

VOLUME DIFFERENCE

The difference in volume between the left ear and the right ear.

features

SOUND SPATIALIZATION

Virtually control the layout of your conference and listen to conversation more attentively as if everyone is in the actual meeting room.

SIDE CHATS

Seamlessly start simultaneous private conversations to quickly discuss details, to create virtual break rooms, or just for fun.

CONTROL

Use administrative tools to restrict your conference and plan ahead all while maintaining a sense of privacy.



progress

HISTORY

The idea for OpenComm was inception by Professor Graeme Bailey of the Computer Science department over 6 years ago. The team was founded by Makoto Bentz '11 in 2009.

SINCE BOOM 2011

The focus of the team has switched from research to implementation. We have developed a full Android application this year and are discussing commercialization.

FUTURE WORK

The team will continue to refine the Android application and perhaps explore working with other platforms. We hope to determine to which fields this technology could be beneficial.

Recipients of Cisco Pioneer Award and GE Imagination in IT award in BOOM 2011

MARKET ADVANTAGES

- + Useful for group projects & meetings
- + Is more convenient than Video chat when on the go
- + Maintains professionalism
- + Serves as a way to split up and reconvene meetings
- + Achieves goals not met by competitors

the team

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find us online



opencomm.github.com

WHERE'S THE BOOM? OpenComm introduces sound spatialization and side chats to create audio conferencing experiences not offered by competitors. Based on the regions of the users' icons, we account for interaural time difference and volume difference when transmitting sound. Our algorithms are masked by a seamless user interface and supported by back-end technologies.