

Android Development Manual (refer to functions in android)

1. Audio Encoding
 - a. AudioSendThread - Thread reads samples from the android hardware and writes it into a byte[] to send it over the network via UDP to the target user
2. Video Encoding
 - a. Set up a Camera object to display the preview frame of the Camera. Then assign the camera a PreviewCallback to handle new YUV images arriving on the preview.
 - b. Take the new arriving images and convert it into jpeg, then write it to a custom output stream called BOutputStream which extends OutputStream. (This is done because the compress to jpeg function doesn't handle size)
 - c. Compressed jpeg is then sent over via UDP to the target.
3. Audio Decoding
 - a. AudioDecodeThread - Thread that handles decoding from UDP packets listening on a specific audio port
 - i. Uses AudioTrack sampled at 11025Hz with a bufferSize of approximately 4160 bytes
 - ii. Decodes packet data and writes it to the speaker
4. Video Decoding
 - a. VideoDecodeThread - Thread that handles video decoding.
 - i. Listens on specific UDP port for jpeg packets. Once a packet is received, the jpg data is passed to the UI thread via a Handler. The Handler then converts this jpeg data into usable bitmap and updates the ImageView on the screen.
5. Pan/Tilt
 - a. Used the TOUCH_DOWN event to notice when a finger touched down, and used the TOUCH_UP event to notice when the finger was lifted. Found difference in x and y and calculated proportional rotation with min and max values of pan/tilt to create realistic experience.
 - i. With values discovered, a pan/tilt packet was sent to the receiver with both an x and y to instruct the webcam to turn
6. Text Messaging
 - a. Handled in the control thread. When a messaging packet is received, it sends the string over to the msgHandler in the UI thread and updates the contents of the drawer
7. Nameserver
 - a. ListUsers - Android sends a list packet to the nameserver and retrieves a list of users
 - b. Registration - When hosting, Android sends an add packet with the username, ip, and port of the new host
 - c. Find - After selecting a user, Android sends a find packet which receives the ip information from a user
8. Statistics

- a. LatencyTimerTask fires off latency calculation packets on a timer for every 30s to help record and see latency statistics
- b. FPS is calculated in the Handler in which the ImageView sets the Bitmap and increments the amount of frames in a specific time frame and sets the textview