CMSC436: Programming Handheld Systems

Fall 2017

Multimedia

Today’s Topics

Multimedia Support Classes

Playing Audio

Watching Video

Recording Audio

Multimedia

Android provides support for encoding and decoding a variety of common media formats

Allows you to play & record audio, still images & video

Some Multimedia Classes

AudioManager & SoundPool

RingtoneManager & Ringtone

MediaPlayer

MediaRecorder

Camera

AudioManager

Manages volume, system sound effects, and ringer mode control

Acquire AudioManager instance via

```
Context.getSystemService(Context.AUDIO_SERVICE)
```

AudioManager

Load & play sound effects

Manage volume

Manage peripherals

SoundPool

Represents a collection of audio samples (streams)

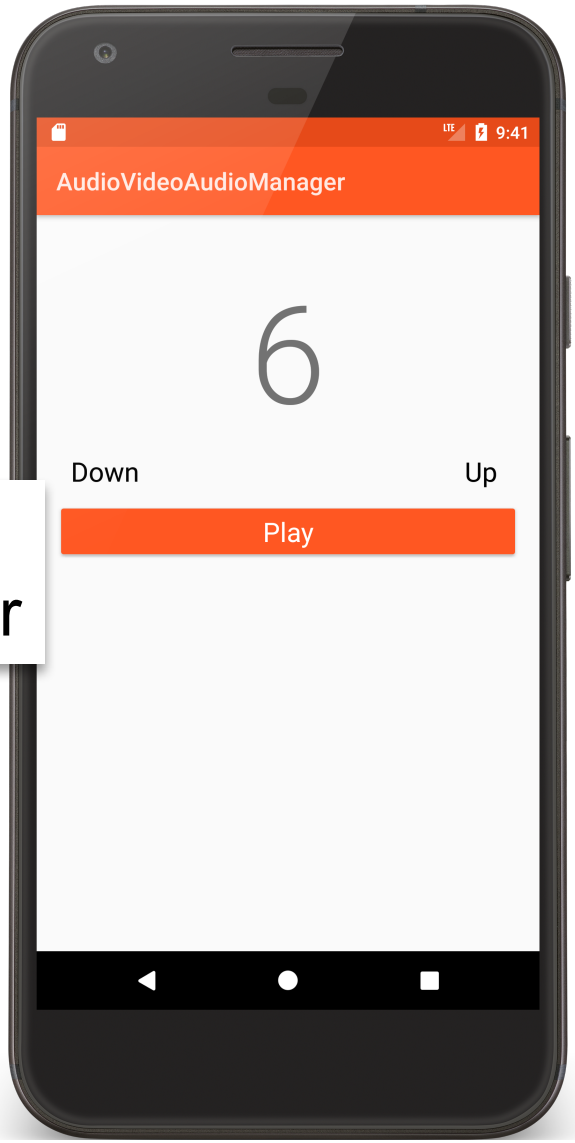
Can mix and play multiple simultaneously

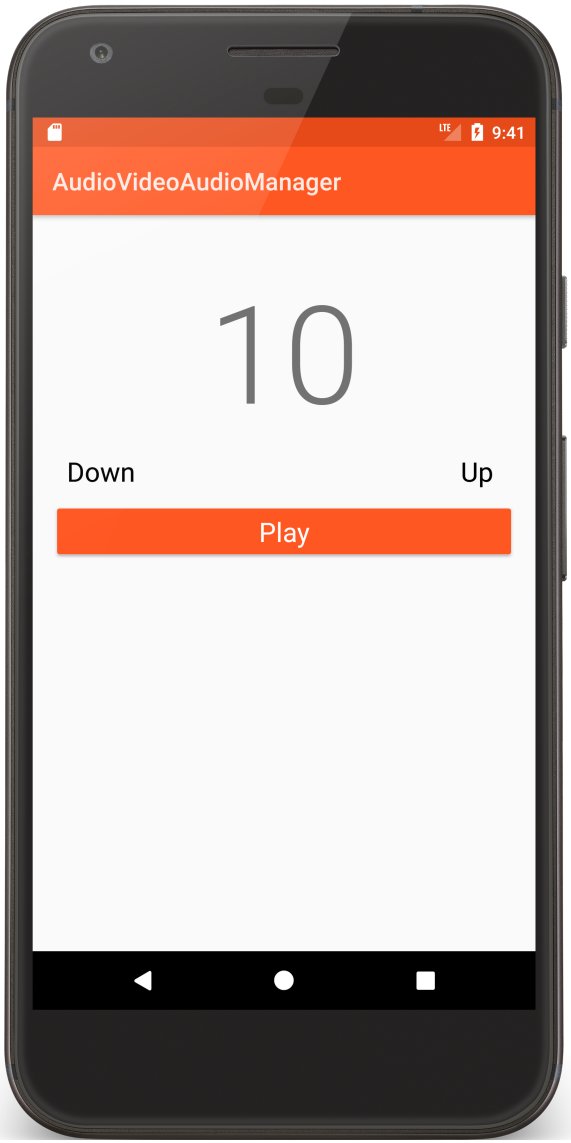
AudioVideoAudioManager

Presents two buttons that adjust the volume up or down

Presents a play button that, when pressed, plays a bubble popping sound at the current volume level

AudioVideo
AudioManager





Ringtone and RingtoneManager

RingtoneManager provides access to

- audio clips used for incoming phone calls, notifications, alarms, etc.

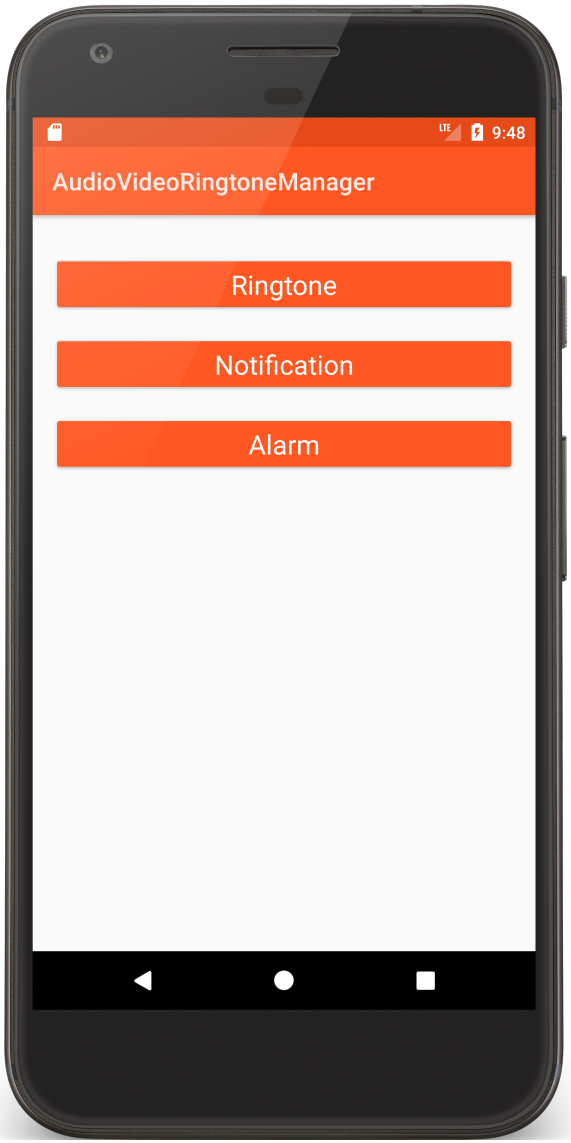
Allows applications to get and set ringtones and to play and stop playing them

AudioVideoRingtoneManager

Application presents three buttons labeled ringtone, notification and alarm

Pressing one of these buttons causes the associated default ringtone to play

AudioVideo
RingtoneManager



MediaPlayer

Controls playback of audio and video streams and files

Allows applications to control playback

Operates according to a complex state machine

See: http://developer.android.com/reference/android/media/MediaPlayer.html

Some MediaPlayer Methods

setDataSource()

prepare()

start()

pause()

seekTo()

stop()

release()

VideoView

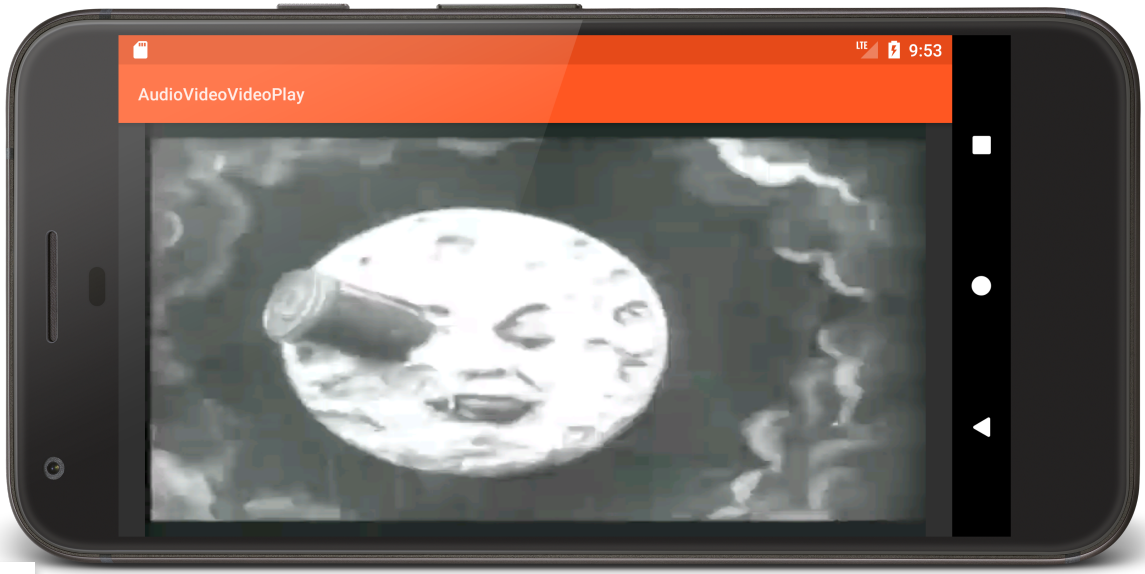
SurfaceView for displaying video files

Can load video from multiple sources

Provides various display options & convenience functions

AudioVideoVideoPlay

Application plays a movie in a VideoView



AudioVideo
VideoPlay

```
public void onCreate(Bundle savedInstanceState) {
  …
    // Get a reference to the VideoView
    mVideoView = findViewById(R.id.videoViewer);

    // Add a Media controller to allow forward/reverse/pause/resume
    final MediaController mMediaController =
                        new MediaController( AudioVideoVideoPlayActivity.this, true);
    mMediaController.setEnabled(false);
    mVideoView.setMediaController(mMediaController);

    mVideoView.setVideoURI(Uri.parse( "android.resource://" +
                                                    getPackageName() + "/raw/moon"));
…
```

```
...
// Add an OnPreparedListener to enable the MediaController once the video is ready
    mVideoView.setOnPreparedListener(new OnPreparedListener() {
      public void onPrepared(MediaPlayer mp) {
        mMediaController.setEnabled(true);
      } }); }

  // Clean up and release resources
  protected void onPause() {
    if (mVideoView != null && mVideoView.isPlaying()) {
      mVideoView.stopPlayback();
      mVideoView = null;
    }
    super.onPause();
  }
}
```

MediaRecorder

Used to record audio and video

Operates in accordance to a state machine

See:
http://developer.android.com/

reference/android/media/
MediaRecorder.html

Some MediaRecorder Methods

setAudioSource()

setVideoSource()

setOutputFormat()

prepare()

start()

stop()

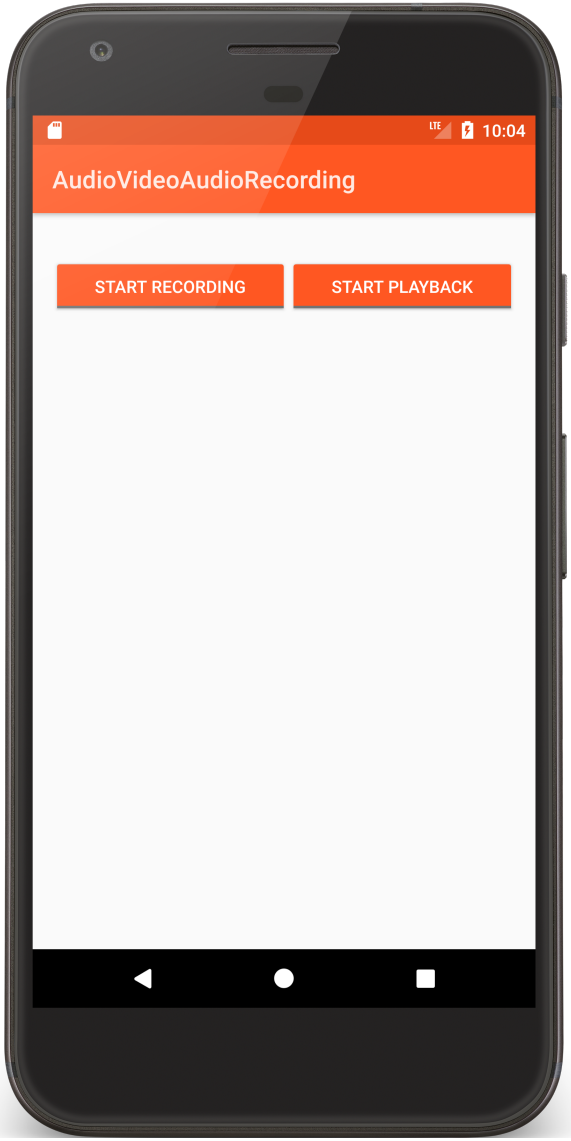
release()

AudioVideoAudioRecording

Can record audio from the user

Can play back recorded audio

AudioVideo
AudioRecording



```
// Start recording with MediaRecorder
private void startRecording() {

    mRecorder = new MediaRecorder();
    mRecorder.setAudioSource(MediaRecorder.AudioSource.MIC);
    mRecorder.setOutputFormat(MediaRecorder.OutputFormat.THREE_GPP);
    mRecorder.setOutputFile(mFileName);
    mRecorder.setAudioEncoder(MediaRecorder.AudioEncoder.AMR_NB);

    try {
        mRecorder.prepare();
    } catch (IOException e) {
        Log.e(TAG, "Couldn't prepare and start MediaRecorder");
    }

    mRecorder.start();
}
```

```
// Playback audio using MediaPlayer
private void startPlaying() {
    mPlayer = new MediaPlayer();
    mPlayer.setOnCompletionListener(new MediaPlayer.OnCompletionListener() {
        public void onCompletion(MediaPlayer mp) {
            mPlayButton.performClick();
            mPlayButton.setChecked(false);
        } });
    try {
        mPlayer.setDataSource(mFileName);
        mPlayer.prepare();
        mPlayer.start();
    } catch (IOException e) {
        Log.e(TAG, "Couldn't prepare and start MediaPlayer");
    }
}
```

```
// Release recording and playback resources, if necessary
public void onPause() {
    super.onPause();

    if (null != mRecorder) {
        mRecorder.release();
        mRecorder = null;
    }

    if (null != mPlayer) {
        mPlayer.release();
        mPlayer = null;
    }
}
```

Next Time

Sensors