

CS378 - Mobile Computing

What's Next?

Fragments

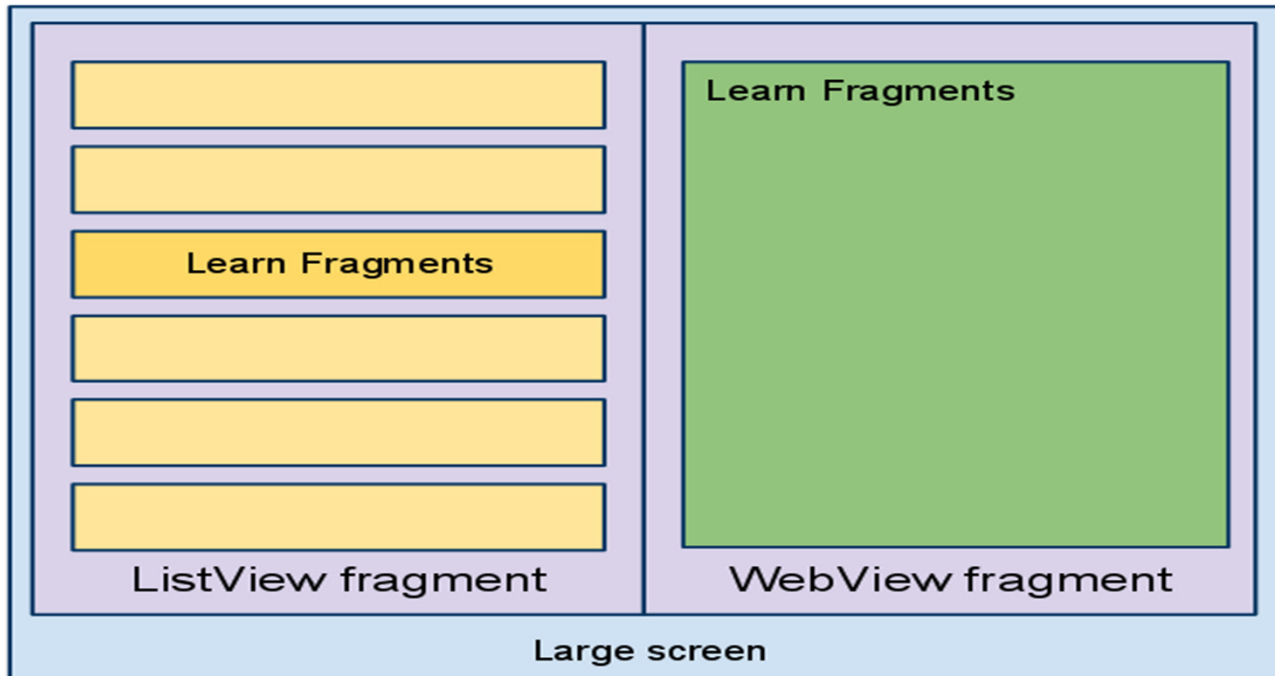
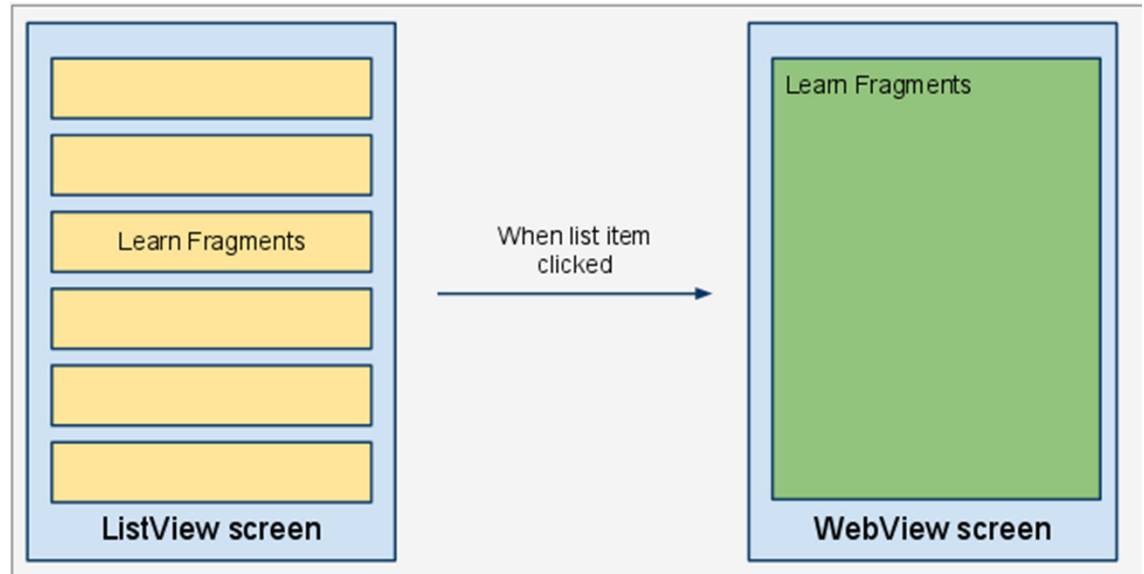
- Added in Android 3.0, a release aimed at tablets
- A fragment is a portion of the UI in an Activity
- multiple fragments can be combined into multi-paned UI
- fragments can be used in multiple activities

Fragments

- Part of an activity
 - directly affected by Activities lifecycle
- Fragments can be swapped into and out of activities without stopping the activity
- On a handset one with limited screen space, common for app to switch from one activity to another
 - with a larger screen swap fragments in and out

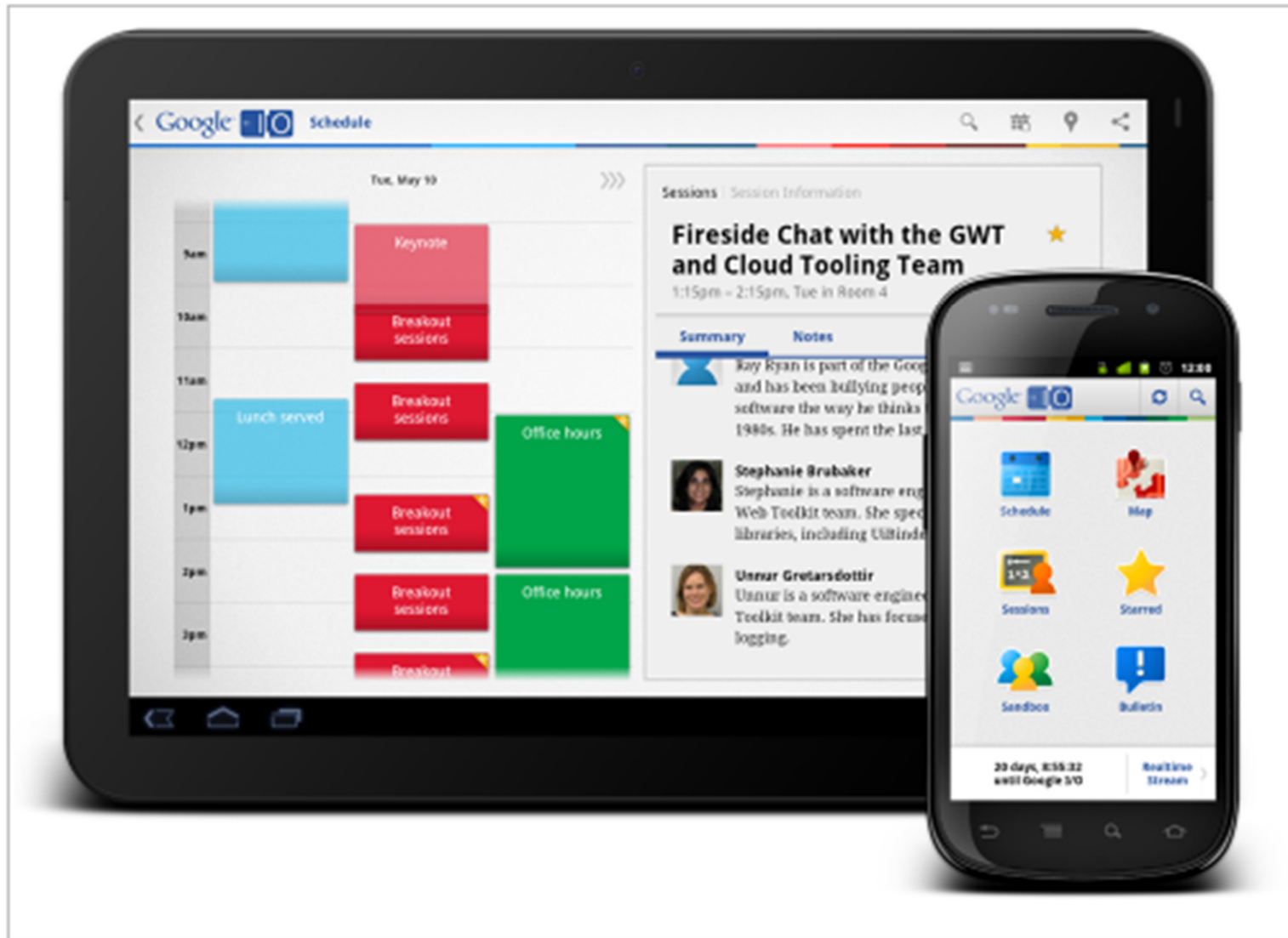
Fragments

old



new

Fragments



STATUS BAR NOTIFICATIONS

Status Bar Notifications

- Status Bar Notifications add an icon to the system's status bar
 - can add a ticker-text message with icon
- and add a message in the notifications window
- When user selects the notification Intent created which can start an Activity
 - can also alert user with sound, vibration, and /or flashing lights on device

Status Bar Notifications

- Used when background service needs to alert user to an event that requires response
 - design: background service should never launch an activity on its own



Figure 1. Status bar with a notification.

Status Bar Notifications

- Advice for Notifications
 - use for time sensitive events
 - ... that involve other people
 - don't create notifications for events not directed at user
 - don't create notification for Activity that is active

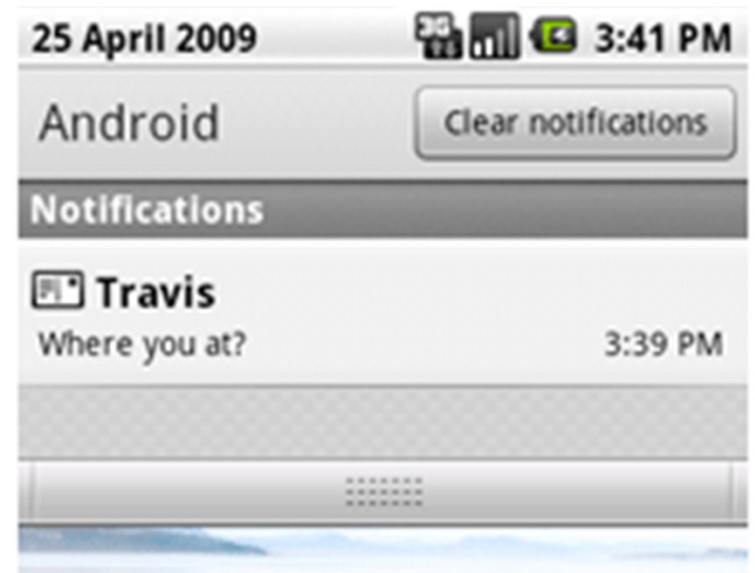
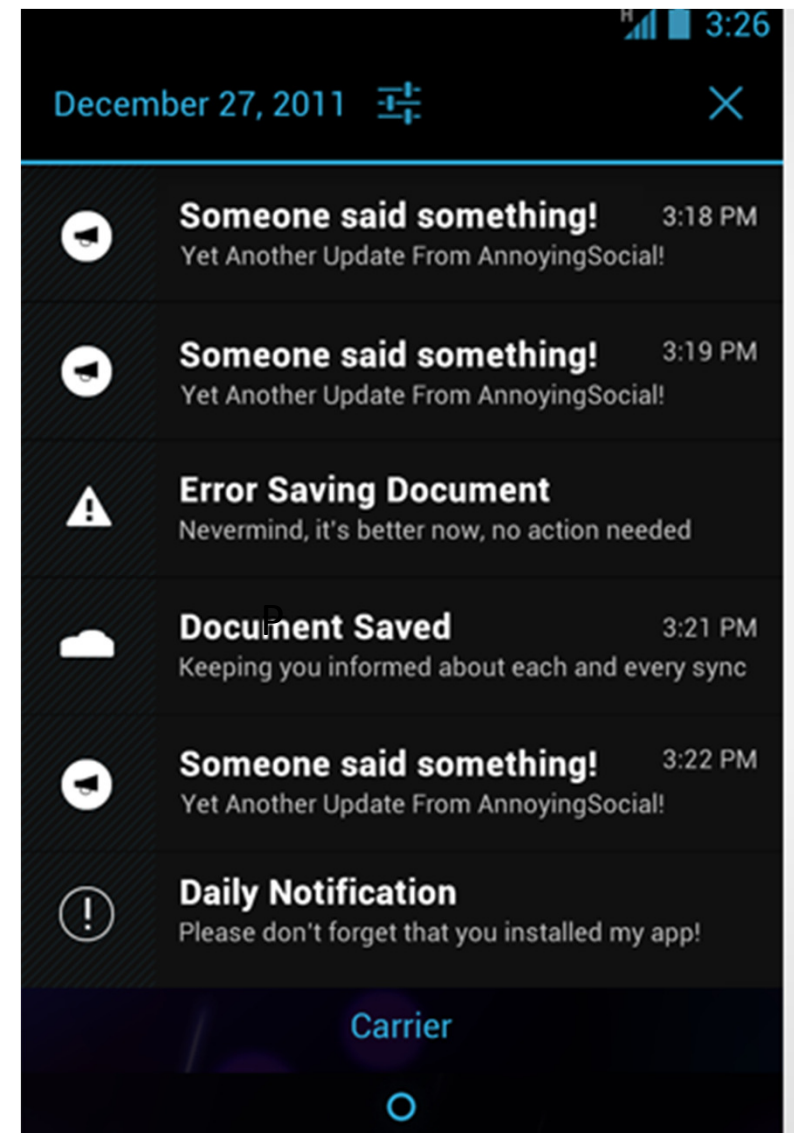


Figure 2. The notifications window.

Notifications Window

- Don't create notifications for low level technical details
- Don't create notifications for errors that user can't fix or if app can recover on its own
- Don't create notifications for services user can't start and stop

Bad Notifications



COPY AND PASTE

Copy and Paste

- clipboard based framework
- simple and complex data types can be copied and pasted
 - text strings, complex data structures, text and binary stream data
- Simple text stored on clipboard
- complex data handled via content providers

Copy and Paste

- to copy and paste:
- data placed in clip object, clip object placed on system-wide clipboard
- clip object can be:
 - text, a simple String
 - URI for copying complex data from a content provider
 - Intents to copy application shortcuts
- only one clip on clipboard at a time

Copy and Paste

- An app can support some or all of the data types
- Examine data on clipboard and decide if user should have option to paste it
 - may not make sense to allow pasting of URI / content provider data or Intents

WIDGETS

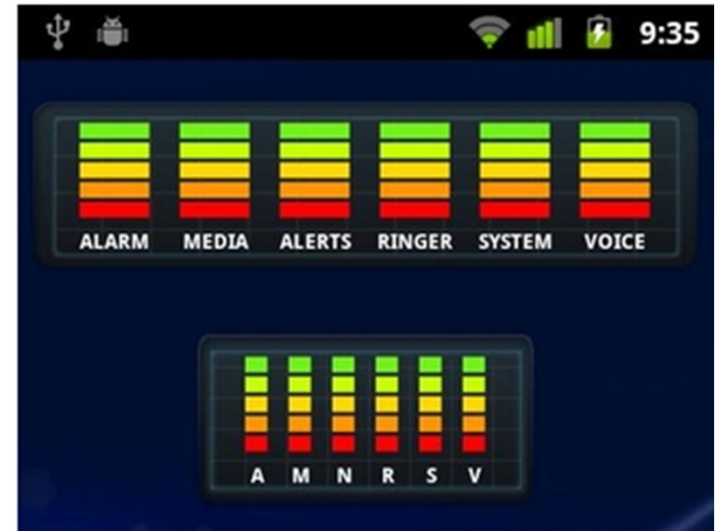
Widgets

- Referred to as an App Widget
- widgets are miniature application views than can be added to other applications
 - normally the Home Screen View
 - other "App Widget Hosts"
- Widget sent periodic updates
- Widgets essentially a BroadcastReceiver with XML layout



Widgets

- To create App Widget:
- Create a `AppWidgetProviderInfo` object that contains metadata for the App Widget, layout, update frequency
 - normally defined in XML
- Implement `AppWidgetProvider` class that defines basic methods to update Widget
- create layout: not all layouts and UI widgets supported



WI-FI DIRECT

Wi-Fi Direct

- Added in ICS, Android 4.0 API level 14
- allows devices with appropriate hardware to connect directly via Wi-Fi with no intermediate access point
- discover and connect to other devices
- much larger range than Bluetooth
- Useful for applications that share data among users
 - multi player game, photo sharing

Wi-Fi Direct

- WifiP2pManager class provides methods to discover, request, and connect to peers
- Various Listeners that provide information on success or failure of method calls from WifiP2pManager
- Intents notify application of events detected by Wi-Fi direct framework such as newly discovered peer
 - implement broadcast receiver for intents from Android system about Wifi Direct

GESTURES

Gestures

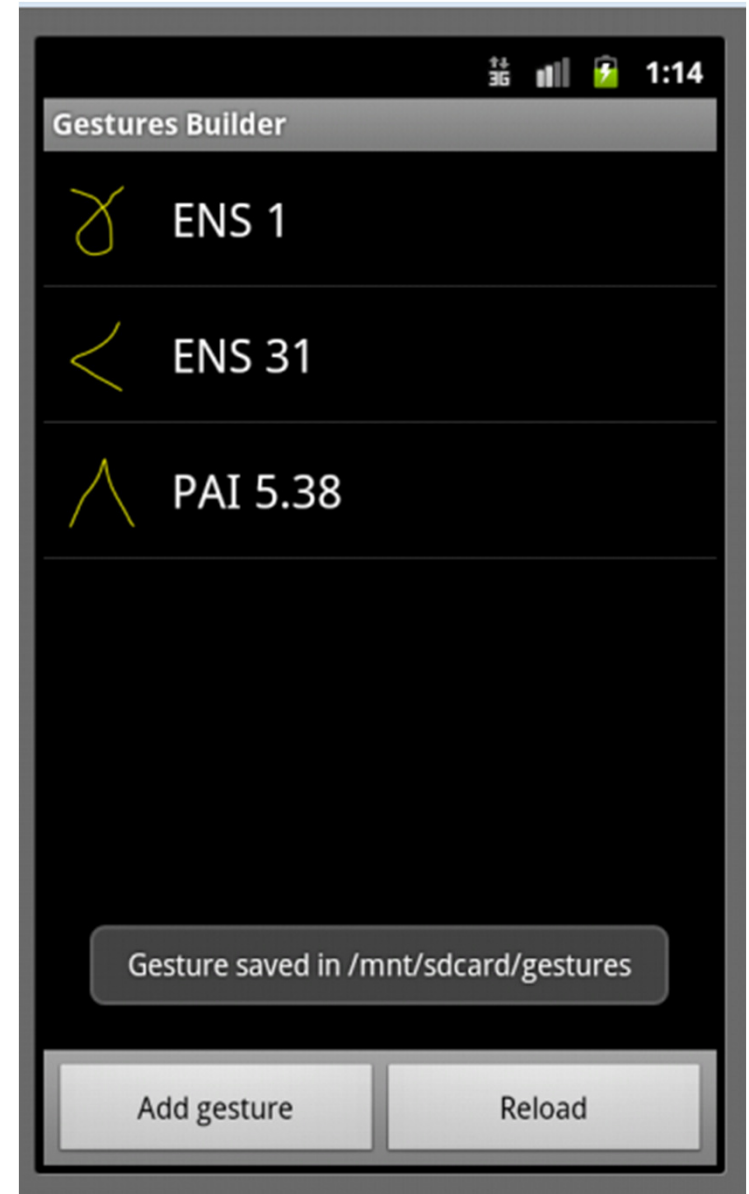
- Standard gestures handled via the GestureDetector class
 - touch event
 - double tap
 - long press
 - fling
 - scroll

Complex Gestures

- Non standard gestures required lots of code to recognize
- Android 1.6 introduced new APIs to store, load, draw, and recognize gestures
- Gesture Builder app on emulator
 - emulator must include virtual SD card
 - allows creating set of gestures for your application

Complex Gestures

- Each gesture associated with name
- multiple gestures can have same name
 - variations on same gesture, better chance of recognizing
- Move gestures from emulator to application res/raw folder



Complex Gestures

- Recognizing gestures via a `GestureOverlayView`
- simple drawing board on top of view that shows and records user gestures
- When gesture complete `GestureLibrary` queried to see if gesture is recognized
- Predictions between entered gesture and those in the library

And Still More!

- Bluetooth
- Near Field Communication
- Live Wallpapers
- Remote Storage
- USB devices (recall radar detector, heart rate monitors)
- Audio Capture, Speech Recognition