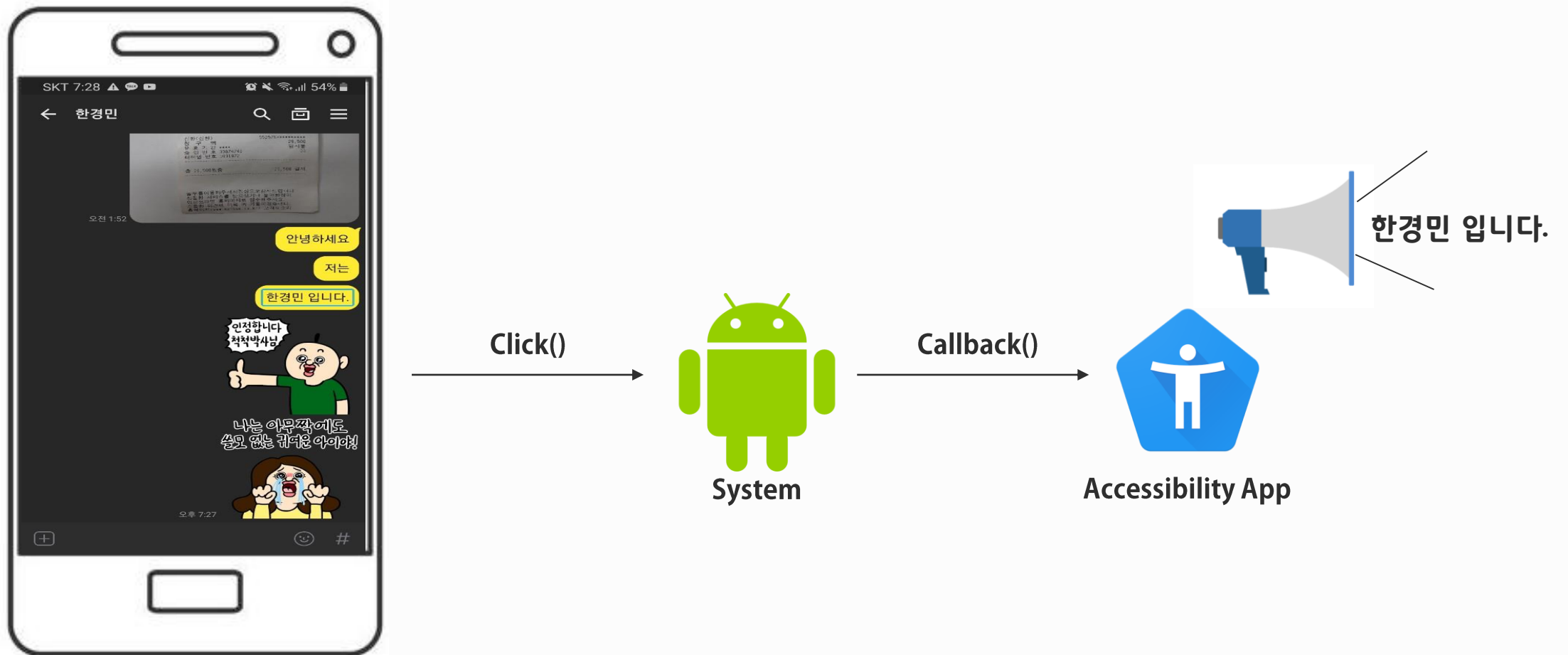


Accessibility Service

Kyeong-Min Han

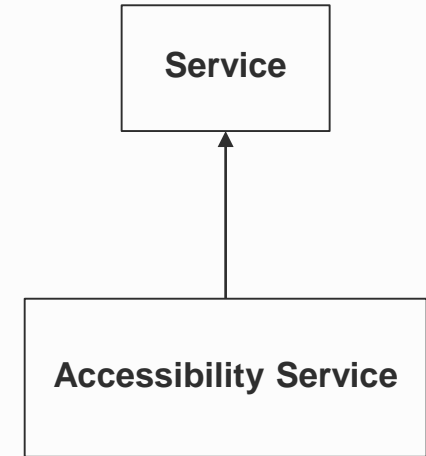
Introduction

- Accessibility services assist user with disabilities in using Android devices and apps



Background

□ Lifecycle



Implementation

□ Code

```
<service android:name=".MyAccessibilityService"
    android:permission="android.permission.BIND_ACCESSIBILITY_SERVICE"
    android:label="@string/accessibility_service_label">
    <intent-filter>
        <action android:name="android.accessibilityservice.AccessibilityService"/>
    </intent-filter>
    <meta-data
        android:name="android.accessibilityservice"
        android:resource="@xml/accessibility_service_config"/>
</service>
```

<AndroidManifest>

```
public class MyAccessibilityService extends AccessibilityService {

    private static final String TAG="AccessibilityService";

    @Override
    protected void onServiceConnected() {
        AccessibilityServiceInfo info=new AccessibilityServiceInfo();
        info.eventTypes=AccessibilityEvent.TYPES_ALL_MASK;
        info.feedbackType=AccessibilityServiceInfo.DEFAULT;
        info.notificationTimeout=100;
        setServiceInfo(info);
    }

    @Override
    public void onAccessibilityEvent(AccessibilityEvent event) {
        if(event.getEventType()==AccessibilityEvent.TYPE_WINDOW_STATE_CHANGED) {
            Log.e(TAG, msg: "Catch Event Package Name : " + event.getPackageName());
            Log.e(TAG, msg: "Catch Event TEXT : " + event.getText());
            Log.e(TAG, msg: "Catch Event getClassName : " + event.getClassName());
            Log.e(TAG, msg: "Catch Event getSource : " + event.getSource());
            Log.e(TAG, msg: "=====");
        }
    }
}
```

Setting

Event receive

<MyAccessibilityService.java>

Implementation

□ Event type, feedback type

Feedback types

- `AccessibilityServiceInfo#FEEDBACK_AUDIBLE`
- `AccessibilityServiceInfo#FEEDBACK_HAPTIC`
- `AccessibilityServiceInfo#FEEDBACK_AUDIBLE`
- `AccessibilityServiceInfo#FEEDBACK_VISUAL`
- `AccessibilityServiceInfo#FEEDBACK_GENERIC`
- `AccessibilityServiceInfo#FEEDBACK_BRAILLE`

Event types

- `AccessibilityEvent#TYPE_VIEW_CLICKED`
- `AccessibilityEvent#TYPE_VIEW_LONG_CLICKED`
- `AccessibilityEvent#TYPE_VIEW_FOCUSED`
- `AccessibilityEvent#TYPE_VIEW_SELECTED`
- `AccessibilityEvent#TYPE_VIEW_TEXT_CHANGED`
- `AccessibilityEvent#TYPE_WINDOW_STATE_CHANGED`
- `AccessibilityEvent#TYPE_NOTIFICATION_STATE_CHANGED`
- `AccessibilityEvent#TYPE_TOUCH_EXPLORATION_GESTURE_START`
- `AccessibilityEvent#TYPE_TOUCH_EXPLORATION_GESTURE_END`
- `AccessibilityEvent#TYPE_VIEW_HOVER_ENTER`
- `AccessibilityEvent#TYPE_VIEW_HOVER_EXIT`
- `AccessibilityEvent#TYPE_VIEW_SCROLLED`
- `AccessibilityEvent#TYPE_VIEW_TEXT_SELECTION_CHANGED`
- `AccessibilityEvent#TYPE_WINDOW_CONTENT_CHANGED`
- `AccessibilityEvent#TYPE_ANNOUNCEMENT`
- `AccessibilityEvent#TYPE_GESTURE_DETECTION_START`
- `AccessibilityEvent#TYPE_GESTURE_DETECTION_END`
- `AccessibilityEvent#TYPE_TOUCH_INTERACTION_START`
- `AccessibilityEvent#TYPE_TOUCH_INTERACTION_END`
- `AccessibilityEvent#TYPE_VIEW_ACCESSIBILITY_FOCUSED`
- `AccessibilityEvent#TYPE_WINDOWS_CHANGED`
- `AccessibilityEvent#TYPE_VIEW_ACCESSIBILITY_FOCUS_CLEARED`

Implementation

□ accessibilityEvent Methods

```
Event receive  
@Override  
public void onAccessibilityEvent(AccessibilityEvent event) {  
    if(event.getEventType()==AccessibilityEvent.TYPE_WINDOW_STATE_CHANGED) {  
        Log.e(TAG, msg: "Catch Event Package Name : " + event.getPackageName());  
        Log.e(TAG, msg: "Catch Event TEXT : " + event.getText());  
        Log.e(TAG, msg: "Catch Event getClassName : " + event.getClassName());  
        Log.e(TAG, msg: "Catch Event getSource : " + event.getSource());  
        Log.e(TAG, msg: "=====");  
    }  
}
```

getEventType()

getRecordCount()

getRecord()

getClassName()

getClass()

getSource()

getContentDescription()

getText()

getPackageName()

getAction()

getContentChangeTypes()

getEventTime()

getMovementGranularity()

getWindowChanges()

getAddedCount()

getBeforeText()

getCurrentItemIndex()

getFromIndex()

getItemCount()

getMaxScrollX()

getMaxScrollY()

getParcelableData()

getRemovedCount()

getScrollDeltaX()

getScrollDeltaY()

getScrollX()

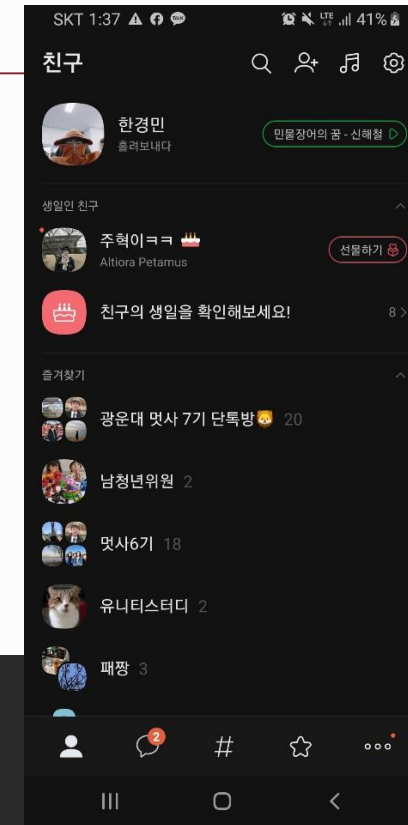
getScrollY()

getToIndex()

getWindowId()

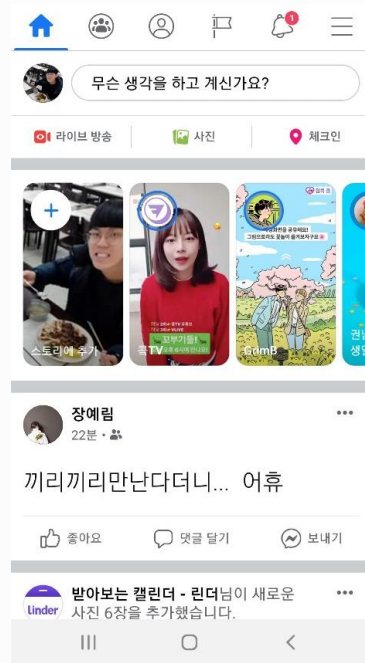
Experiment

□ kakaotalk

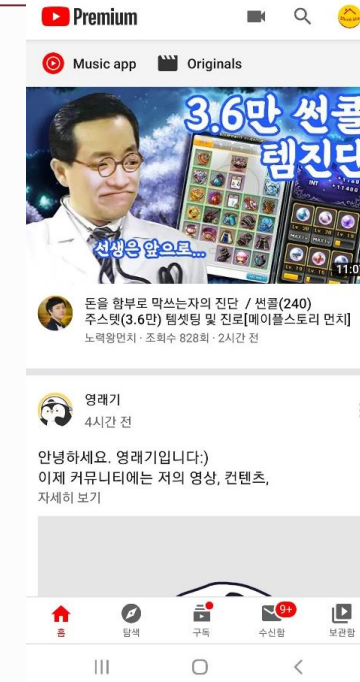


```
E/AccessibilityService: Catch Event Package Name : com.kakao.talk
E/AccessibilityService: Catch Event TEXT : []
E/AccessibilityService: Catch Event getClassName : android.widget.FrameLayout
E/AccessibilityService: Catch Event getSource : null
E/AccessibilityService: =====
E/AccessibilityService: Catch Event Package Name : com.kakao.talk
E/AccessibilityService: Catch Event TEXT : [카카오톡]
E/AccessibilityService: Catch Event getClassName : com.kakao.talk.activity.SplashActivity
E/AccessibilityService: Catch Event getSource : android.view.accessibility.AccessibilityNodeInfo@80006e99; boundsInParent: Rect(0, 0 - 1080, 2220); boundsInScreen: Rect(0, 0 - 1080, 2220); packageName: com.kakao.talk; className: android.widget.FrameLayout;
E/AccessibilityService: =====
E/AccessibilityService: Catch Event Package Name : com.kakao.talk
E/AccessibilityService: Catch Event TEXT : [카카오톡]
E/AccessibilityService: Catch Event getClassName : com.kakao.talk.activity.TaskRootActivity
E/AccessibilityService: Catch Event getSource : null
E/AccessibilityService: =====
E/AccessibilityService: Catch Event Package Name : com.kakao.talk
E/AccessibilityService: Catch Event TEXT : [친구]
E/AccessibilityService: Catch Event getClassName : com.kakao.talk.activity.main.MainTabFragmentActivity
E/AccessibilityService: Catch Event getSource : android.view.accessibility.AccessibilityNodeInfo@80006e9b; boundsInParent: Rect(0, 0 - 1080, 2220); boundsInScreen: Rect(0, 0 - 1080, 2220); packageName: com.kakao.talk; className: android.widget.FrameLayout;
```

Experiment



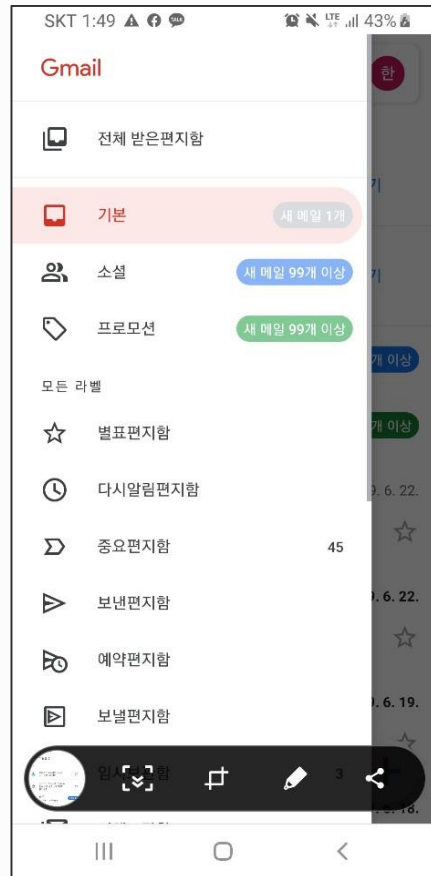
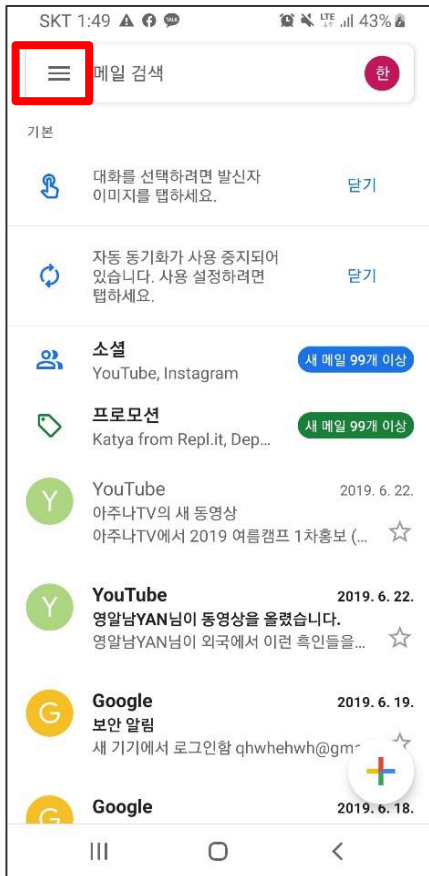
```
E/AccessibilityService: Catch Event Package Name : com.facebook.katana
E/AccessibilityService: Catch Event TEXT : []
E/AccessibilityService: Catch Event getClassName : android.widget.FrameLayout
E/AccessibilityService: Catch Event getSource : null
E/AccessibilityService: =====
E/AccessibilityService: Catch Event Package Name : com.facebook.katana
E/AccessibilityService: Catch Event TEXT : [Facebook]
E/AccessibilityService: Catch Event getClassName : com.facebook.katana.activity.FbMainTabActivity
E/AccessibilityService: Catch Event getSource : android.view.accessibility.AccessibilityNodeInfo@80006ec4;
E/AccessibilityService: =====
```



```
E/AccessibilityService: Catch Event Package Name : com.google.android.youtube
E/AccessibilityService: Catch Event TEXT : []
E/AccessibilityService: Catch Event getClassName : android.widget.FrameLayout
E/AccessibilityService: Catch Event getSource : null
E/AccessibilityService: =====
E/AccessibilityService: Catch Event Package Name : com.google.android.youtube
E/AccessibilityService: Catch Event TEXT : [YouTube]
E/AccessibilityService: Catch Event getClassName : com.google.android.apps.youtube.app.WatchWhileActivity
E/AccessibilityService: Catch Event getSource : android.view.accessibility.AccessibilityNodeInfo@80006ec4;
E/AccessibilityService: =====
```


Experiment

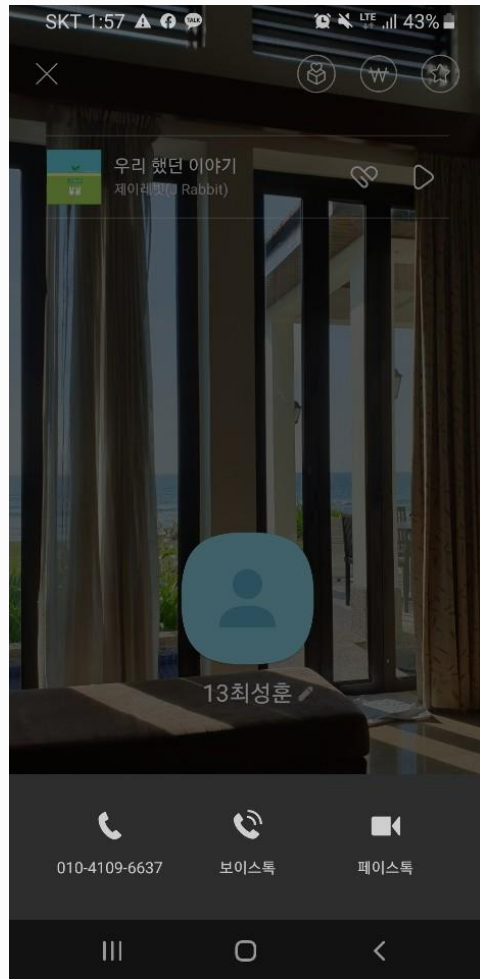
□ Gmail



```
E/AccessibilityService: Catch Event Package Name : com.google.android.gm
E/AccessibilityService: Catch Event TEXT : []
E/AccessibilityService: Catch Event getClassName : android.widget.FrameLayout
E/AccessibilityService: Catch Event getSource : null
E/AccessibilityService: =====
E/AccessibilityService: Catch Event Package Name : com.google.android.gm
E/AccessibilityService: Catch Event TEXT : [Gmail]
E/AccessibilityService: Catch Event getClassName : com.google.android.gm.ui.MailActivityGmail
E/AccessibilityService: Catch Event getSource : android.view.accessibility.AccessibilityNodeInfo@80006ee8;
E/AccessibilityService: =====
E/AccessibilityService: Catch Event Package Name : com.google.android.gm
E/AccessibilityService: Catch Event TEXT : [탐색]
E/AccessibilityService: Catch Event getClassName : androidx.drawerlayout.widget.DrawerLayout
E/AccessibilityService: Catch Event getSource : android.view.accessibility.AccessibilityNodeInfo@19772; tou
E/AccessibilityService: =====
```

Experiment

□ Click event

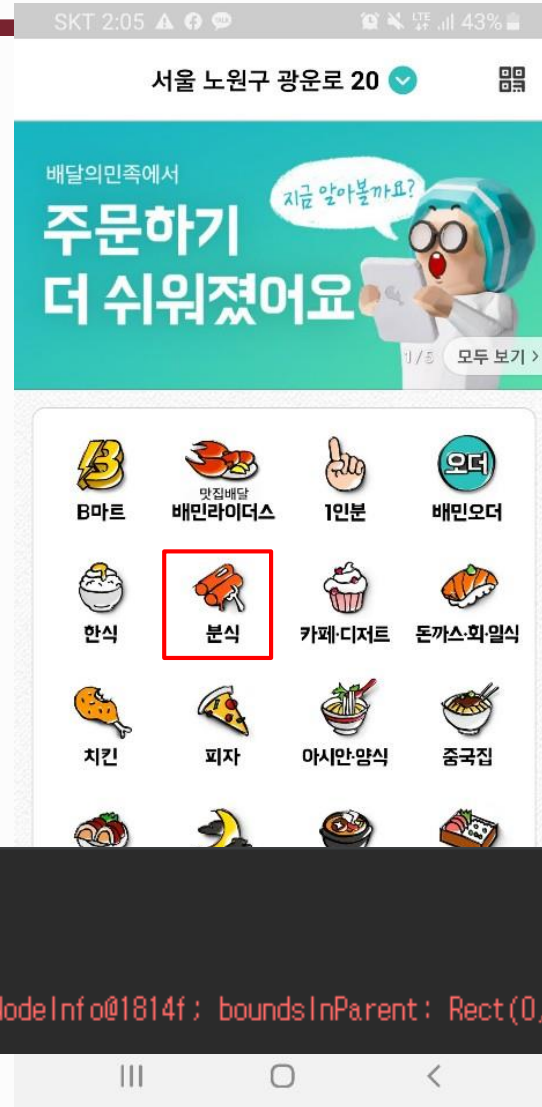


```
E/AccessibilityService: Catch Event Package Name : com.kakao.talk  
E/AccessibilityService: Catch Event TEXT : [010-4109-6637]  
E/AccessibilityService: Catch Event className : android.widget.RelativeLayout  
E/AccessibilityService: Catch Event getSource : null  
E/AccessibilityService: =====
```

```
E/AccessibilityService: Catch Event Package Name : com.samsung.android.incallui  
E/AccessibilityService: Catch Event TEXT : [전화를 거는 중..., 13최성훈]  
E/AccessibilityService: Catch Event className : null  
E/AccessibilityService: Catch Event getSource : null  
E/AccessibilityService: =====
```

Experiment

- Button position & size



Catch Event Package Name : com.sampleapp

Catch Event TEXT : [분식]

Catch Event getClassName : android.widget.ImageView

Catch Event getSource : android.view.accessibility.AccessibilityNodeInfo@1814f; boundsInParent: Rect(0, 0 - 245, 245); boundsInScreen: Rect(295, 1079 - 540, 1324);