1. INTRODUCTION

In this demonstration, we present SmartLocAuth: location-based authentication using space dependent information such as service set identifier (SSID) from WLAN access points. SmartLocAuth is a location-based authentication system. Figure 1 illustrates the concept of SmartLocAuth. SmartLocAuth can realize that an application can be unlocked within a predefined authentication area. There are three features on SmartLocAuth.

- Does not need GPS, unlike existing location-based authentication system [1]. Therefore, SmartLocAuth can be used indoor as well as outdoor environment.
- Can limit authentication area (within several meters).
- Not troublesome to unlock, unlike password.

2. SYSTEM DESIGN

SmartLocAuth uses Authentication list and Registration list. There are two processes in SmartLocAuth as follows:

- **Process of registration**
  1. Detect SSIDs around the device for \( T_A \) second.
  2. Add the detected SSIDs into its Registration list.
- **Process of authentication**
  1. Detect SSIDs around the device.
  2. Add the SSIDs into its Authentication list.
  3. Compare Registration list and Authentication list, then compute the concordance rate \( P \).
  4. If \( P \) is equal or greater than the threshold of the concordance rate \( P_{th} \), the authentication is succeed. If not, the authentication is failed.

\[ P = \frac{\text{Number of concordance}}{\text{Number of SSIDs in Authentication list}} \times 100 \]

The number of concordance is defined as the number of SSIDs which are included in both Registration list and Authentication list.

3. IMPLEMENTATION

We implement SmartLocAuth in Galaxy Nexus (Android 4.0) and Nexus 4 (Android 4.2). Figure 2 shows the screen shot of SmartLocAuth. After selecting applications to lock (a), the process of registration starts (b). When a user launches the application (c), the process of authentication is called. If the authentication succeeds, the application is unlocked (d). If not, the application is still locked (e).

Note that an existing location-based authentication [2] can lock/unlock applications when the smartphone is connecting to a preregistered WLAN such as home. SmartLocAuth has an advantage that WLAN connections are unnecessary.

We have confirmed that SmartLocAuth can limit several meters of authentication area via indoor experiments.

4. REFERENCES


[2] Unlock With WiFi
http://benhirashima.com/unlockwithwifi/