**Assumption**

* ~~A1 : No concurrent user accesses. e.g.~~
	1. ~~Access through a control panel and access through a web page are exclusive; both cannot happen at the same time.~~
	2. ~~Only one control panel is installed in a house~~
* ~~A2 : Internet connection between a homeowner (i.e., homeowner’s smartphone or notebook) and the SafeHome system is always available.~~
* ~~A3 : All devices including cameras, sensors, and the SafeHome main system communicate using IEEE 802.11x protocol.~~

**Functional Requirements**

1. SafeHome bootup/shutdown service
	1. ~~Self-diagnosis – check whether connected sensors and cameras are ok.~~
	2. Initialize/finish sensors
	3. Initialize/finish cameras
2. Configuration service
	1. Password
		1. Type of password
			1. Control panel - digits
			2. ~~Web access~~ Java application GUI – alphabets and digits
		2. Length of password
			1. Control panel – 4 digits
			2. ~~Web access~~ Java application GUI – at least 8 characters
	2. ~~Floor plan~~
		1. ~~Floor structure~~
			1. ~~Distance scale~~
			2. ~~Wall~~
			3. ~~Door~~
		2. ~~Registering new devices~~
		3. ~~Relocating devices~~
	3. Security zone – a set of devices (e.g., sensors and cameras) which are manipulated as a group
	4. ~~Backup plan for power off – Which devices could be turned off? Which devices should be turned on?~~
	5. ~~Session timeout – See~~ [~~5.A Athentication.session~~](#_Hlk418156511)~~.~~
3. Real-time security service
	1. Arming the entire SafeHome system
	2. Disarming the entire SafeHome system
	3. Arming device(s)
	4. Disarming device(s)
	5. Alarming methods – Sound alarm, SMS, smartphone push alarm, and so on.
	6. ~~Enabling travel mode – Turning lights on/off~~
	7. Sensor
		1. Types
			1. Motion detector
			2. Window sensor
			3. ~~CO2 sensor~~
			4. ~~Fire sensor~~
			5. ~~Doggie angst sensor~~
		2. Output data format – ~~binary, real number, or complex data?~~ (API is provided.)
	8. Camera
		1. ~~Recording~~
			1. ~~Format of movie – H264, MPEG, and so on~~
			2. ~~Quality of movie – minimum required FPS issue~~
		2. Viewing
			1. A single camera
			2. All cameras through thumbnail view
		3. Controlling
			1. Zooming
			2. Panning
		4. ~~Movie storage~~
4. ~~Us~~~~er-requested information retrieval service~~
	1. ~~Finding ID/Password~~
	2. ~~Reporting system usage pattern~~
	3. ~~Reporting web page access history~~
	4. ~~Replaying recorded movie~~
5. System status reporting service
	1. Current status e.g. System is idle, armed, turned off, and so on.
6. Authentication
	1. ~~Session~~
		1. ~~Closing a session after certain timeout; See~~ [~~2.E Session timeout~~](#_Hlk418156781)~~.~~
	2. Control panel
		1. Input control panel password e.g. 4-digits password
		2. ~~Access permission is granted to only one session. See~~ [~~Assumption A1~~](#_Hlk418156474)
	3. ~~Webpage~~
		1. Input ID and password(s) e.g. ID and two levels of passwords
		2. ~~Access permission is granted to only one session. See~~ [~~Assumption A1~~](#_Hlk418156474)
7. User interface
	1. Control panel
		1. Input device – Keypad (12 keys)
		2. Output device
			1. LED notification (arm on/off and power on/off status)
			2. LCD display description
	2. ~~Web page~~ Java application GUI
		1. Configuration features. See [2. Configuration service](#_Hlk418157040).
		2. Real-time security features; See [3. Real-time security service](#_Hlk418157017).
		3. ~~Reporting service features; See~~ [~~4. User-requested reporting service~~](#_Hlk418156992)~~.~~
		4. ~~Web page should be designed mobile-friendly.~~

**~~Nonfunctional Requirements~~**

* ~~SafeHome system should respond to sensor events in real-time.~~