

# **OMSE 510 – Software Estimation**

## **Assignment #2**

**Due 7/26/09**

You are in charge for creating a lines of code estimate for a home security system that is being developed by your company. You have been charged with providing this estimate via function points (See Chapter 18 in the book for a discussion of function points if needed) using Adjusted Function Points and the SPR method (see note below) as opposed to using the IFPUG method. The company's function point complexity ratings can be found in Table #18-1 in the Software Estimation text.

The system will contain the following components:

- Controller (with associated monitoring devices) for door and window alarms
- Controller (with associated monitoring devices) for motion detectors
- Controller (with associated monitoring devices) for panic buttons
- Controller (with associated monitoring devices) for fire detectors
- Controller (with associated monitoring devices) for CO2 detectors
- Controller (with associated devices) for light activator and deactivator
- Controller/Monitor for key device (to turn system on and off)
- Wireless dial-out device with controller

Based on this information and the block diagram of the system below, determine the number of unadjusted function points for the system. Then using the SPR method determine adjusted function points. Once the adjusted function points have been computed, use the conversion (or gearing) factors found in Table 18-3 in the Software Estimation text, convert to the number of lines of code (for the language you think best suits this project).

**Please send questions to Chris Gilmore via Blackboard or email ([grimjack@cs.pdx.edu](mailto:grimjack@cs.pdx.edu))**

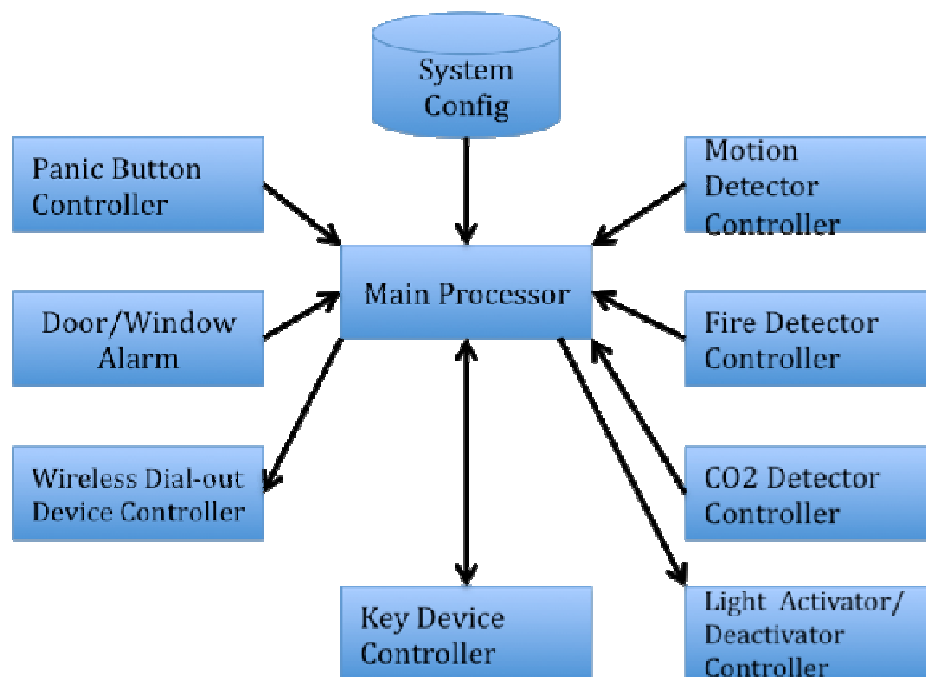
**Format of your estimate:**

Please ensure that your estimate contains the following items

- Name of the estimator

- Base data and critical assumptions shaping the estimate (show the work done in calculating the function points, explain why program characteristics where low, medium or high complexity)
- Critical influence/adjustment factors and values used (Why you chose the SPR adjustment factors you did and how you chose the language that best suits this project)
- A Range of Estimates: best case, worst case, most-likely case

The block diagram of the system to be created:



### Notes on the SPR method and function points:

Terminology:

- AFP – Adjusted Function Points
- UFP – Unadjusted Function Points
- VAF – Value Adjustment Factor
- PC – Program Complexity
- DC – Data Complexity

The general formula for AFP is:  $AFP = UFP * (0.65 + 0.01 + VAF)$  but in the SPR method the calculation is this:

$$AFP = UFP * (0.4 + 0.1 * (PC + DC))$$

PC and DC are values from 1 to 5 determined by picking from the following:

**Program Complexity Rating**

1. All simple algorithms and simple calculations
2. Majority of simple algorithms and simple calculations
3. Algorithms and calculations of average complexity
4. Some difficult or complex algorithms or calculations
5. Many difficult algorithms and complex calculations

**Data Complexity Rating**

1. Simple data with few elements and relationships
2. Numerous variables and constant data types, but simple relationships
3. Average complexity with multiple files, fields, and data relationships
4. Complex file structures and complex data relationships
5. Very complex file structures and very complex data relationships

Example:

So if a program had a UFP of 35 and the program was very complex but had simple data elements, you would chose a PC of 5 and a DC of 1, giving the following:

$$\begin{aligned} \text{AFP} &= \text{UFP} * (0.4 + 0.1 * (\text{PC} + \text{DC})) \\ &= 35 * (0.4 + 0.1 * (5 + 1)) \\ &= 35 * (0.4 + 0.1 * 6) \\ &= 35 * (0.4 + 0.6) \\ &= 35 * 1 \\ &= 35 \end{aligned}$$

So the AFP for this program is 35