

**DEPARTMENT** **OF** **COMPUTER** **SCIENCE** **&** **ENGINEERING** **THE** **UNIVERSITY** **OF** **TEXAS** **AT** **ARLINGTON**

**DETAILED** **DESIGN** **SPECIFICATION** **CSE** **4317:** **SENIOR** **DESIGN** **II** **FALL** **2020**

**TEAM** **HYDRO** **BLUETOOTH** **HYDROMETER**

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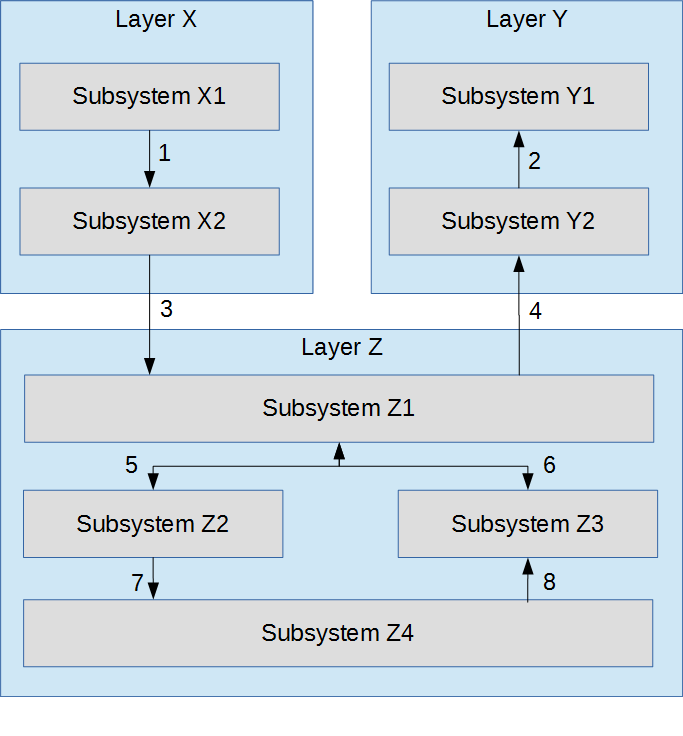
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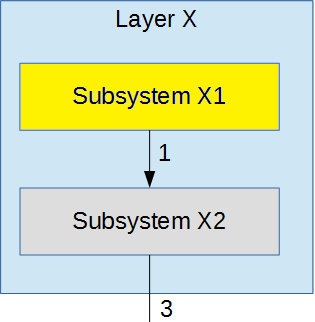
**1** **INTRODUCTION**

Your introduction should provide a brief overview of the product concept and a reference to the require-ment speciﬁcation and architectural design documents in 1 or 2 paragraphs. The purpose is to provide the reader with the location of relevant background material that lead to the design details presented in this document.

**2** **SYSTEM** **OVERVIEW**

This section should reintroduce the full data ﬂow diagram from the architectural speciﬁcation, and discuss at a high level the purpose of each layer. You do not need to include a subsection for each layer, a 1 - 2 paragraph recap is sufﬁcient.

Figure 1: System architecture



**3** **X** **LAYER** **SUBSYSTEMS**

In this section, the layer is described in terms of the hardware and software design. Speciﬁc imple-mentation details, such as hardware components, programming languages, software dependencies, op-erating systems, etc. should be discussed. Any unnecessary items can be ommitted (for example, a pure software module without any speciﬁc hardware should not include a hardware subsection). The organization, titles, and content of the sections below can be modiﬁed as necessary for the project.

**3.1** **LAYER** **HARDWARE**

A description of any involved hardware components for the layer. For example, if each subsystem is a software process running on an embedded computer, discuss the speciﬁcs of that device here. Do not list a hardware component that only exists at the subsystem level (include it in the following sections).

**3.2** **LAYER** **OPERATING** **SYSTEM**

A description of any operating systems required by the layer. **3.3** **LAYER** **SOFTWARE** **DEPENDENCIES**

A description of any software dependencies (libraries, frameworks, etc) required by the layer. **3.4** **SUBSYSTEM** **1**

Descibe at a high level the purpose and basic design of this subsystem. Is it a piece of hardware, a class, a web service, or something else? Note that each of the subsystem items below are meant to be speciﬁc to that subystem and not a repeat of anything discussed above for the overall layer.

Figure 2: Example subsystem description diagram

**3.4.1** **SUBSYSTEM** **HARDWARE**

A description of any involved hardware components for the subsystem.

**3.4.2** **SUBSYSTEM** **OPERATING** **SYSTEM**

A description of any operating systems required by the subsystem.

**3.4.3** **SUBSYSTEM** **SOFTWARE** **DEPENDENCIES**

Adescriptionofanysoftwaredependencies(libraries, frameworks, designsoftwareformechanicalparts or circuits, etc) required by the subsystem.

**3.4.4** **SUBSYSTEM** **PROGRAMMING** **LANGUAGES**

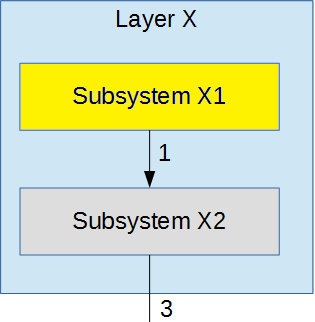
A description of any programming languages used by the subsystem.

**3.4.5** **SUBSYSTEM** **DATA** **STRUCTURES**

A description of any classes or other data structures that are worth discussing for the subsystem. For example, data being transmitted from a microcontroller to a PC via USB should be ﬁrst be assembled into packets. What is the structure of the packets?

**3.4.6** **SUBSYSTEM** **DATA** **PROCESSING**

A description of any algorithms or processing strategies that are worth discussing for the subsystem. If you are implementing a well-known algorithm, list it. If it is something unique to this project, discuss it in greater detail.



**4** **Y** **LAYER** **SUBSYSTEMS**

In this section, the layer is described in terms of the hardware and software design. Speciﬁc imple-mentation details, such as hardware components, programming languages, software dependencies, op-erating systems, etc. should be discussed. Any unnecessary items can be ommitted (for example, a pure software module without any speciﬁc hardware should not include a hardware subsection). The organization, titles, and content of the sections below can be modiﬁed as necessary for the project.

**4.1** **LAYER** **HARDWARE**

A description of any involved hardware components for the layer. For example, if each subsystem is a software process running on an embedded computer, discuss the speciﬁcs of that device here. Do not list a hardware component that only exists at the subsystem level (include it in the following sections).

**4.2** **LAYER** **OPERATING** **SYSTEM**

A description of any operating systems required by the layer. **4.3** **LAYER** **SOFTWARE** **DEPENDENCIES**

A description of any software dependencies (libraries, frameworks, etc) required by the layer. **4.4** **SUBSYSTEM** **1**

Descibe at a high level the purpose and basic design of this subsystem. Is it a piece of hardware, a class, a web service, or something else? Note that each of the subsystem items below are meant to be speciﬁc to that subystem and not a repeat of anything discussed above for the overall layer.

Figure 3: Example subsystem description diagram

**4.4.1** **SUBSYSTEM** **HARDWARE**

A description of any involved hardware components for the subsystem.

**4.4.2** **SUBSYSTEM** **OPERATING** **SYSTEM**

A description of any operating systems required by the subsystem.

**4.4.3** **SUBSYSTEM** **SOFTWARE** **DEPENDENCIES**

Adescriptionofanysoftwaredependencies(libraries, frameworks, designsoftwareformechanicalparts or circuits, etc) required by the subsystem.

**4.4.4** **SUBSYSTEM** **PROGRAMMING** **LANGUAGES**

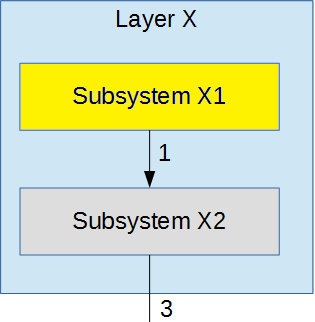
A description of any programming languages used by the subsystem.

**4.4.5** **SUBSYSTEM** **DATA** **STRUCTURES**

A description of any classes or other data structures that are worth discussing for the subsystem. For example, data being transmitted from a microcontroller to a PC via USB should be ﬁrst be assembled into packets. What is the structure of the packets?

**4.4.6** **SUBSYSTEM** **DATA** **PROCESSING**

A description of any algorithms or processing strategies that are worth discussing for the subsystem. If you are implementing a well-known algorithm, list it. If it is something unique to this project, discuss it in greater detail.



**5** **Z** **LAYER** **SUBSYSTEMS**

In this section, the layer is described in terms of the hardware and software design. Speciﬁc imple-mentation details, such as hardware components, programming languages, software dependencies, op-erating systems, etc. should be discussed. Any unnecessary items can be ommitted (for example, a pure software module without any speciﬁc hardware should not include a hardware subsection). The organization, titles, and content of the sections below can be modiﬁed as necessary for the project.

**5.1** **LAYER** **HARDWARE**

A description of any involved hardware components for the layer. For example, if each subsystem is a software process running on an embedded computer, discuss the speciﬁcs of that device here. Do not list a hardware component that only exists at the subsystem level (include it in the following sections).

**5.2** **LAYER** **OPERATING** **SYSTEM**

A description of any operating systems required by the layer. **5.3** **LAYER** **SOFTWARE** **DEPENDENCIES**

A description of any software dependencies (libraries, frameworks, etc) required by the layer. **5.4** **SUBSYSTEM** **1**

Descibe at a high level the purpose and basic design of this subsystem. Is it a piece of hardware, a class, a web service, or something else? Note that each of the subsystem items below are meant to be speciﬁc to that subystem and not a repeat of anything discussed above for the overall layer.

Figure 4: Example subsystem description diagram

**5.4.1** **SUBSYSTEM** **HARDWARE**

A description of any involved hardware components for the subsystem.

**5.4.2** **SUBSYSTEM** **OPERATING** **SYSTEM**

A description of any operating systems required by the subsystem.

**5.4.3** **SUBSYSTEM** **SOFTWARE** **DEPENDENCIES**

Adescriptionofanysoftwaredependencies(libraries, frameworks, designsoftwareformechanicalparts or circuits, etc) required by the subsystem.

**5.4.4** **SUBSYSTEM** **PROGRAMMING** **LANGUAGES**

A description of any programming languages used by the subsystem.

**5.4.5** **SUBSYSTEM** **DATA** **STRUCTURES**

A description of any classes or other data structures that are worth discussing for the subsystem. For example, data being transmitted from a microcontroller to a PC via USB should be ﬁrst be assembled into packets. What is the structure of the packets?

**5.4.6** **SUBSYSTEM** **DATA** **PROCESSING**

A description of any algorithms or processing strategies that are worth discussing for the subsystem. If you are implementing a well-known algorithm, list it. If it is something unique to this project, discuss it in greater detail.

**6** **APPENDIX** **A**

Include any additional documents (CAD design, circuit schematics, etc) as an appendix as necessary.