Final Report

grade based on completeness (35%)

quality of analysis and research (50%)

adherence to format, grammar

spelling (15%).

Template Follows:

**Social Interactivity Mentor for Youth with Autism NAO Robot (SIMYAN)**

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**ECE 4890 / CE 4899 -001**

**December 4, 2020**

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# Problem Overview – William Ross

1-2 paragraphs

Problem introduction –like an abstract. A high level summary introduction to the problem area and specific problem. What are the objectives? Benefits? Key issues? Is there relevant history? ***Motivate why this problem is important to work on.*** Anybody including your parents should be able to read this, and be able to tell you what you are working on. No Jargon. Don’t write: BLE; don’t write: Bluetooth Low Energy; write: ultra-low power wireless communications.

# Problem Statement – William Ross

This should be the problem statement agreed by you and the sponsor…Did you show them this?

* Make sure it is complete—everything the customer needs must be here, no matter how trivial sounding…
* Everything must be specifiable—no vague statements like “feels nice” or “looks good”
* What are the boundaries of the project? Standards? Size? Location? Power? Operating conditions? Operating life? … but none of these should be specific numbers here— say “outdoors” or “solar power”
* Highlight conflicting needs—that’s one place where engineering trade-offs show up. You may want use something like figure 3.9 or figure 3.10 on page 33
* Things the customer wants but does not need could be stretch goals (Stretch goal does not mean more work or extra hard to do…it means the customer will be happier if you can do it but satisfied without it)

# Standards Discussion – Andrew Nguyen

Discuss the standards you have found in your research which apply or may appear to apply to this problem. You may also need to discuss standards which *do not* apply, in some cases.

Standards fall broadly into two categories

* Established by industry/government/standards organizations (Example: SuperSpeed USB 10Gbps (USB 3.1 Gen 2) from the USB-IF)
* Established by reasonably respected companies as specifications for their products (example: TI MSP430 electrical, programming, mechanical, operating conditions specifications, as found on datasheets, for example)

Your literature search should come upon many possible standards which must be adhered to (or which will not be adhered to—you may adhere to USB 2.1 not 3.1 for instance, you should explain why). The customer should agree in all cases. You must discuss each standard in detail, but do not discuss standards which you do not know yet will apply—for instance, if you expect to use an ADC chip, but have not chosen the specific chip yet, you should include a place for the chip standards to be discussed in the final report, but all details should be “TBD” at this point—you could write:

ADC Chip -- TBD

# Constraints Discussion – Colton Homuth

Discuss *each* of the following constraints which may limit your proposal and project in some way. If a constraint does not apply, state there is no constraint and give a reason. It is expected that constraints *do* exist for most of these issues for your project, you may need to think deeply and consider the problem widely. There may be additional constraints for your problem which you should add to this discussion. (note: you don’t need to start each section with “For this Project”)

## Economic

For this project…

## Environmental

For this project…

## Social

For this project…

## Political

For this project…

## Ethical

For this project…

## Health and Safety

For this project…

## Manufacturability

For this project…

## Sustainability

For this project …

# Requirements Analysis and Literature Search [written by]

Explain your process for developing the requirements specification. This process necessarily includes an extensive literature search and survey of existing solutions and technology. Use figures and words from the text liberally. Answer these questions where appropriate and expand on them (not just yes/no answers); these are example topics for discussion, you should include other suitable topics. Remember, this is about what the customer needs, not about the design of the solution.

* Are you working with an informed or a frontier customer? What important points result from this?
* Analyze important points of how this problem is solved by others, if no similar solution, analyze why not.
* What existing technology could be useful?
* Summarize how your real-world constraints influence the requirements. How do they influence your specifications?
* List the needs and wants
* What are the project boundaries?
* Do you have an input/output analysis?
* Can you preview the user interface?
* Have you surveyed design attributes?
* Do you have conflicting needs?

Explain how you translated important and special things from the requirements analysis to the requirements specification

# Requirements Specification – All

Preferably in table format.

Re-read sections 3.2—3.4 in the text!

These should be the specifications agreed to by you and the sponsor—

Quantify the problem statement—“outdoors” becomes -20C--+50C, 5%--95% humidity, etc.

How will you know when you are done?

What tests must be passed?

Everything you need to design needs to be specified, even if the customer doesn’t know it

This is not where you detail your solution!

(Note: in later presentations and reports you may need to expand or adjust the requirements specification with items from 3.4.1—3.4.4 such as analysis of a similar design or results from testing prototypes or requirements which are excessive or impossible, any of which leads to a modification of the requirements specifications)

# Team Organization – Bryce George

Your team must have somebody with overall responsibility for an area—an area manager. This does not mean the manager must do all of the tasks, or even any of the tasks, but if there are problems in that area, it’s their responsibility to resolve, and they take the primary blame. For instance, the Design Manger will most likely be doing part of the design but not all of it; there could be one or two people working on hardware design, and another working on software design, for instance. The Design Manager needs to know what each member is doing, are they on schedule, how to resolve issues, and communicates with the project manager. It doesn’t need to be formalized in that way in a group with 5 people, but there needs to be somebody who can stand up and take responsibility for the good and the bad. For teams with less than 5 members, some people may have 2 or 3 manager roles to fill.

Project Manager: Bryce George

Communications & Logistics Managers: Colton Homuth & William Ross

Design Manager:

Standards and Test Manager: Andrew Nguyen

# Team Constraints – Bryce George

Survey the landscape you are in

* Each team member, 1-2 sentences: degree major, skills, interests, future plans (job, startup, grad school…)
* Missing skills you need
* Anything else?

Do not solve these issues here—just say what they are

# Operational Description – Bryce George

Describe roughly how it will be operated, what are the things humans and/or other machines must do for your project to function. This is not how your project responds to the environment—the sun will rise in the morning whether you want or not, and your project will start recharging a battery if so designed; the human merely must orient it towards the sun. Additional requirements may be derived from the operational description.

# Block Diagram – Andrew Nguyen

Very rough at this point—Inputs, outputs, blocks of basic function, not specific devices or programs

# System Design Expectations – Colton Homuth

What needs to be designed? Where do you expect to make your mark on this project? What will you synthesize, what are the questions you need to find the right answers for? Don’t answer yet, but show what the unknowns are, what are the things which could have a big impact?

# Draft Budget – William Ross

Can be very rough, but try to list what needs to be purchased and costs as you think they may be, as well as sources of income. A range is OK. Where you receive donations, write that—for instance, if you will receive IC’s free note that and the sources

# Deliverables – Bryce George

What will be on the table at the front of the room in May?

# Appendix – All

Original problem statement for the RFQ

# Compiled By Bryce George