

PC/CP 320 Project Overview

Terry Sturtevant

Wilfrid Laurier University

October 15, 2020

Outline

Outline

There are 2 projects this term.

Outline

There are 2 projects this term.

- *Integration* project

Outline

There are 2 projects this term.

- *Integration* project

Brings together several things you've done in lab

Outline

There are 2 projects this term.

- *Integration* project

Brings together several things you've done in lab

- *Exploration* project

Outline

There are 2 projects this term.

- *Integration* project

Brings together several things you've done in lab

- *Exploration* project

Allows you to investigate something that has been mentioned, but you haven't used in the lab

Outline

Outline

Why two projects?

Outline

Why two projects?

- The integration project only involves previously-seen material.

Outline

Why two projects?

- The integration project only involves previously-seen material. The challenge is adapting the code to incorporate all of them.

Outline

Why two projects?

- The integration project only involves previously-seen material. The challenge is adapting the code to incorporate all of them.
- The exploration project introduces something you've never used.

Outline

Why two projects?

- The integration project only involves previously-seen material. The challenge is adapting the code to incorporate all of them.
- The exploration project introduces something you've never used. The challenge is learning how to use it.

Outline

Why two projects?

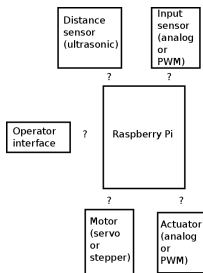
- The integration project only involves previously-seen material. The challenge is adapting the code to incorporate all of them.
- The exploration project introduces something you've never used.

The challenge is learning how to use it.

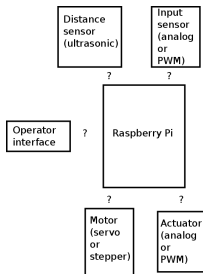
Trying to combine both would make it too easy to get overwhelmed.

Integration project

Integration project



Integration project



Note that the “?” may include more than just signals, such as a D/A or A/D converter.

Note on inputs and outputs

Note on inputs and outputs

- The “other” input must be *multivalued*.

Note on inputs and outputs

- The “other” input must be *multivalued*.
A single switch is insufficient.

Note on inputs and outputs

- The “other” input must be *multivalued*.
A single switch is insufficient.
- The “other” output must be *multivalued*.

Note on inputs and outputs

- The “other” input must be *multivalued*.
A single switch is insufficient.
- The “other” output must be *multivalued*.
A single on/off LED is insufficient.

Note on operator interaction

Note on operator interaction

- Interaction is more than simply running the program.

Note on operator interaction

- Interaction is more than simply running the program.
Having a choice of “mode” is an option.

Note on operator interaction

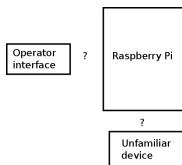
- Interaction is more than simply running the program.
Having a choice of “mode” is an option.
Being able to change parameters is an option.

Note on operator interaction

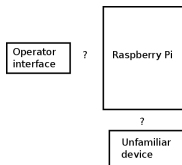
- Interaction is more than simply running the program.
Having a choice of “mode” is an option.
Being able to change parameters is an option.
- Being able to do these things while the system is operating, (instead of just when the program starts), is ideal.

Exploration project

Exploration project



Exploration project



Note instead of using an unfamiliar *device*, you can explore some other *programming options*.

- There are 6 weeks exclusively for the projects.

- There are 6 weeks exclusively for the projects.
Three weeks are exclusively for the integration project.

- There are 6 weeks exclusively for the projects.
Three weeks are exclusively for the integration project.
Three weeks are mostly for the exploration project.

- There are 6 weeks exclusively for the projects.
 - Three weeks are exclusively for the integration project.
 - Three weeks are mostly for the exploration project.

Note: If you think about what you want to do for the exploration project early, you can experiment while you are working on the integration project and will be able to change your mind if necessary.

Schedule

Schedule

Three weeks are exclusively for the integration project.

Schedule

Three weeks are exclusively for the integration project.

- Week 1; Demonstrate 2 input and/or output devices working.

Schedule

Three weeks are exclusively for the integration project.

- Week 1; Demonstrate 2 input and/or output devices working.
A motor is easy since those are recent.

Schedule

Three weeks are exclusively for the integration project.

- Week 1; Demonstrate 2 input and/or output devices working.

A motor is easy since those are recent.

The ultrasonic sensor is easy since it was recent.

Schedule

Three weeks are exclusively for the integration project.

- Week 1; Demonstrate 2 input and/or output devices working.

A motor is easy since those are recent.

The ultrasonic sensor is easy since it was recent.

They may not yet interact; they just need to be connected and functional at the same time.

Schedule

Three weeks are exclusively for the integration project.

- Week 1; Demonstrate 2 input and/or output devices working.

A motor is easy since those are recent.

The ultrasonic sensor is easy since it was recent.

They may not yet interact; they just need to be connected and functional at the same time.

- Week 2; Demonstrate previous devices *and others*.

Schedule

Three weeks are exclusively for the integration project.

- Week 1; Demonstrate 2 input and/or output devices working.

A motor is easy since those are recent.

The ultrasonic sensor is easy since it was recent.

They may not yet interact; they just need to be connected and functional at the same time.

- Week 2; Demonstrate previous devices *and others*.

Decide on 3rd device to be used.

Schedule

Three weeks are exclusively for the integration project.

- Week 1; Demonstrate 2 input and/or output devices working.

A motor is easy since those are recent.

The ultrasonic sensor is easy since it was recent.

They may not yet interact; they just need to be connected and functional at the same time.

- Week 2; Demonstrate previous devices *and others*.

Decide on 3rd device to be used.

Decide on 4th device to be used.

Schedule (continued)

Schedule (continued)

- Week 3; Demonstrate all devices together.

Schedule (continued)

- Week 3; Demonstrate all devices together.

They may not yet interact; they just need to all be connected and functional at the same time.

Schedule (continued)

- Week 3; Demonstrate all devices together.

They may not yet interact; they just need to all be connected and functional at the same time.

You still need to figure out what kind of *operator interaction* your system is going to have.

Schedule (continued)

Schedule (continued)

There are three weeks mostly for the exploration project.

Schedule (continued)

There are three weeks mostly for the exploration project.

- Week 1; Choose device/technique to explore and learn about it.

Schedule (continued)

There are three weeks mostly for the exploration project.

- Week 1; Choose device/technique to explore and learn about it.

There are lots of resources online.

Schedule (continued)

There are three weeks mostly for the exploration project.

- Week 1; Choose device/technique to explore and learn about it.

There are lots of resources online.

Demonstrate the completed integration project.

Schedule (continued)

There are three weeks mostly for the exploration project.

- Week 1; Choose device/technique to explore and learn about it.

There are lots of resources online.

Demonstrate the completed integration project.

This includes operator interaction.

Schedule (continued)

There are three weeks mostly for the exploration project.

- Week 1; Choose device/technique to explore and learn about it.

There are lots of resources online.

Demonstrate the completed integration project.

This includes operator interaction.

- Week 2; Demonstrate basic functionality of the device *OR* programming option.

Schedule (continued)

There are three weeks mostly for the exploration project.

- Week 1; Choose device/technique to explore and learn about it.

There are lots of resources online.

Demonstrate the completed integration project.

This includes operator interaction.

- Week 2; Demonstrate basic functionality of the device *OR* programming option.

Show the device doing *something*.

Schedule (continued)

There are three weeks mostly for the exploration project.

- Week 1; Choose device/technique to explore and learn about it.

There are lots of resources online.

Demonstrate the completed integration project.

This includes operator interaction.

- Week 2; Demonstrate basic functionality of the device *OR* programming option.

Show the device doing *something*.

Show the programming technique *somehow*, e.g. possibly using someone else's code.

Schedule (continued)

Schedule (continued)

- Week 3; Demonstrate advanced functionality.

Schedule (continued)

- Week 3; Demonstrate advanced functionality.
Show it doing *something that wasn't in any of the resources you found*.
- *Demonstrate the completed exploration project.*

Schedule (continued)

- Week 3; Demonstrate advanced functionality.
Show it doing *something that wasn't in any of the resources you found*.
- *Demonstrate the completed exploration project.*
Be sure to highlight what you came up with on your own.

Project Substitution Option

Project Substitution Option

- You have the option of *combining* the projects as follows:

Project Substitution Option

- You have the option of *combining* the projects as follows:
An *unfamiliar* input device can replace one input device for the integration project.

Project Substitution Option

- You have the option of *combining* the projects as follows:
An *unfamiliar* input device can replace one input device for the integration project.
An *unfamiliar* output device can replace one output device for the integration project.

Project Substitution Option

- You have the option of *combining* the projects as follows:
 - An *unfamiliar* input device can replace one input device for the integration project.
 - An *unfamiliar* output device can replace one output device for the integration project.
- If you make this your 4th device, you can determine feasibility during the first week.**

Project Substitution Option

- You have the option of *combining* the projects as follows:
 - An *unfamiliar* input device can replace one input device for the integration project.
 - An *unfamiliar* output device can replace one output device for the integration project.
- If you make this your 4th device, you can determine feasibility during the first week.**
- If you're going to use an unfamiliar programming option, you can determine feasibility during the first week.**

Project Substitution Option

- You have the option of *combining* the projects as follows:
 - An *unfamiliar* input device can replace one input device for the integration project.
 - An *unfamiliar* output device can replace one output device for the integration project.
- If you make this your 4th device, you can determine feasibility during the first week.**
- If you're going to use an unfamiliar programming option, you can determine feasibility during the first week.**

This means that you are basically doing the projects in parallel.

Ramifications

Ramifications

- For the exploration project, if you're going to use an unfamiliar programming option, you should try to incorporate it with your integration project.

Ramifications

- For the exploration project, if you're going to use an unfamiliar programming option, you should try to incorporate it with your integration project.
(In some cases, it may be able to replace some required components.)

Ramifications

- For the exploration project, if you're going to use an unfamiliar programming option, you should try to incorporate it with your integration project.
(In some cases, it may be able to replace some required components.)
It may use functionality you created for the integration project.

Ramifications

- For the exploration project, if you're going to use an unfamiliar programming option, you should try to incorporate it with your integration project.
(In some cases, it may be able to replace some required components.)
It may use functionality you created for the integration project.
- *If you can show it working on time as the 4th device, the integration demonstration can be delayed.*

Ramifications

- For the exploration project, if you're going to use an unfamiliar programming option, you should try to incorporate it with your integration project.
(In some cases, it may be able to replace some required components.)
It may use functionality you created for the integration project.
- *If you can show it working on time as the 4th device, the integration demonstration can be delayed.*