

Party-Rover-0 - VIAM Rover - Robot Club Project Status

Project Start Date: 4/11/2023

2022-2023 Team Members: Mr. Burnham

Project Resource Page: [STEAM Clown's Google Site - VIAM Rovers / Robots](#)

Overview:

This is the VIAM Rover project page.

Project Resources & Links:

This is a list of project resources and links. It should include links to data sheets, tutorials, Youtube, or other sites with relevant information for this project.

- [VIAM site](#)
-

Next Steps (The Big List):

This is a list of the next steps for this project. Next time you work on it, these are the steps you are going to work on. Each time you work on this project, you might add or re-order these tasks.

- ☒ ~~Follow the Raspberry Pi imaging steps~~
- ☐ Sometime 3 d print a SD card holder that goes inside the Rover body
- ☐ Verify that we can get IP address to be sticky at home, School and on Eye-Of-Sauron, of figure a way out to have a fixed IP address on Eye-Of-Sauron
- ☐ See about adding a battery monitor on top so you can see the state of your batteries
- ☒ ~~See if I can get a JASON file loaded with the motors configured.~~
- ☐ See if this all world on a Raspberry Pi 3B
- ☐



5/6/2023 - Working on installing the Viam SDK

What Is The Plan Today:

try to install the Viam SDK

Planned Task List:

- ☐ Follow the instructions found <https://python.viam.dev/>
- ☐ Installing on my Linux laptop, and on the raspberry Pi... not sure if that is a good idea.

Useful Reference Links:

- <https://python.viam.dev/>
-

What Did We Working On Today:

- <https://python.viam.dev/>
- Had to stop and learn about the \$PATH variable and how to update it...
<https://linuxize.com/post/how-to-add-directory-to-path-in-linux/>
- Also did a dive into sourcing a setup script.... where we could put the path commands and other stuff to start the viam-server and stuff
- **What Worked - What Steps Did I/We Solve:**
 - looks like the running of the python code worked, but the web server part did not, so it seems I can't "start" the interface
 -
- **Challenges, Questions, or Roadblocks:**

List all the current issues that are a challenge and preventing forward progress on this project

 - ☐ I think I need to figure out how to load and open the SDK, as the current pages I have been on don't show opening a viam sdk environment.

What Will We Work On Next Time?

- ☐ Figure out if the SDK is a IDE interface
 - ☐ Figure out why my web server does not work and load the viam page
-

4/17/2023 Woohoo, I can add Motors... by copying a JSON file

What Is The Plan Today:

Have a call with Charlotte, and see if I can make progress loading a pre-build JASON file, and see if this all works on a Raspberry Pi 3B

Planned Task List:

- ☒ ~~See if I can get a JASON file loaded with the motors configured.~~
- ☐ See if this all world on a Raspberry Pi 3B
- ☐ get the LED added to my new Party-Rover-0 template
- ☐ be able to copy my Party -Rover-0 JASON file to my new Rover on a RPi3B

Useful Reference Links:

- [Creating a Rover Raspberry Pi Image](#)
- <https://docs.viam.com/tutorials/get-started/make-an-led-blink-with-the-viam-app/>
- <https://docs.viam.com/try-viam/rover-resources/rover-tutorial-fragments/>
-

What Did We Working On Today:

- Created a new Raspberry Pi 3B image using the 64 bit desktop Raspberry Pi Bullseye image.
-

What Worked - What Steps Did I/We Solve:

- Short description of what your team did today... Date driven... as you enter entries, keep the latest at the top. Also, whenever you post an update here, also update the Project Resource Page as well...
- Copied a Jason File from the VIAN Rover Green-Bird

```
{
  "components": [
    {
      "depends_on": [],
      "model": "pi",
      "name": "local",
      "type": "board",
      "attributes": {
        "digital_interrupts": [
          {
```

```

        "name": "re",
        "pin": "37"
    },
    {
        "name": "le",
        "pin": "35"
    }
]
}
},
{
    "model": "gpio",
    "name": "right",
    "type": "motor",
    "attributes": {
        "board": "local",
        "encoder": "Renc",
        "min_power_pct": 0.3,
        "pins": {
            "pwm": "22",
            "a": "16",
            "b": "18"
        },
        "ticks_per_rotation": 996
    },
    "depends_on": [
        "local",
        "Renc"
    ]
},
{
    "attributes": {
        "encoder": "Lenc",
        "min_power_pct": 0.3,
        "pins": {
            "b": "13",
            "pwm": "15",

```

```

        "a": "11"
    },
    "ticks_per_rotation": 996,
    "board": "local"
},
"depends_on": [
    "local",
    "Lenc"
],
"model": "gpio",
"name": "left",
"type": "motor"
},
{
    "type": "base",
    "attributes": {
        "wheel_circumference_mm": 217,
        "width_mm": 260,
        "left": [
            "left"
        ],
        "right": [
            "right"
        ],
        "spin_slip_factor": 1.76
    },
    "depends_on": [
        "left",
        "right",
        "local"
    ],
    "model": "wheeled",
    "name": "viam_base"
},
{
    "depends_on": [
        "local"
    ]
}

```

```
],
  "model": "webcam",
  "name": "cam",
  "type": "camera",
  "attributes": {
    "video_path": "/dev/cams/cam0",
    "debug": true
  }
},
{
  "attributes": {
    "board": "local",
    "pins": {
      "i": "re"
    }
  },
  "depends_on": [
    "local"
  ],
  "model": "single",
  "name": "Renc",
  "type": "encoder"
},
{
  "depends_on": [
    "local"
  ],
  "model": "single",
  "name": "Lenc",
  "type": "encoder",
  "attributes": {
    "pins": {
      "i": "le"
    },
    "board": "local"
  }
},
}
```

```

    {
      "attributes": {},
      "depends_on": [],
      "model": "webgamepad",
      "name": "WebGamepad",
      "type": "input_controller"
    }
  ],
  "services": [
    {
      "name": "base_rc",
      "type": "base_remote_control",
      "attributes": {
        "control_mode": "joystickControl",
        "input_controller": "WebGamepad",
        "base": "viam_base"
      },
      "depends_on": [
        "viam_base",
        "WebGamepad"
      ]
    }
  ],
  "remotes": [
    {
      "address": "octagon-1-main.jcdlnluk0p.local.viam.cloud:8080",
      "auth": {
        "entity": "octagon-1-main.jcdlnluk0p.local.viam.cloud",
        "credentials": {
          "type": "api-key",
          "payload": "vCbJTj9NscAqgJiQulBmoUSgLMyfIGkiE2ntdIac"
        }
      },
      "insecure": false,
      "name": "overhead-cam"
    }
  ]

```

}

-
- dd
- dd
- **Challenges, Questions, or Roadblocks:**
List all the current issues that are a challenge and preventing forward progress on this project
 - ☐ Next step..
 - ☐ Next Step...

What Will We Work On Next Time?

- ☐ (fill this out at the end of class/open lab activity time)
- ☐ List your next 2-5 steps or activities.
- ☐ This is key!!!
- ☐ You need to be thinking about this project as a whole, and break it down into
- ☐ small tasks you can complete in 30-60 min
- ☐ Be sure these items get on your Big list

4/15/2023 - Got Rover Pi imaged and just powering the Pi - No Motors>

What Is The Plan Today:

Setup Pi and see if I can do some simple stuff, without any motors.

Planned Task List:

- ☐ Document the steps to startup what needs to happen when power is turned on, and Auto start a connection.

Useful Reference Links:

-

What Did We Working On Today:

- Got an LED working based on the <https://docs.viam.com/tutorials/get-started/make-an-led-blink-with-the-viam-app/>
- **What Worked - What Steps Did I/We Solve:**

- Following the tutorial above worked, but seemed to only work for 1 LED. If I added a green and then I also added a RedLED, it seemed to only let one at a time.
- Also I seemed to find that the PIN did not "stick" and seemed to be cleared in the GUI each time I reloaded the Party-Rover-0 sessions.

What Will We Work On Next Time?

- ☐ See if I can get a JASON file loaded with the motors configured.
- ☐ See if this all world on a Raspberry Pi 3B

4/11/2023 Just Starting, so Booting a New Raspberry Pi Image

What Is The Plan Today:

Work through the getting started tutorials and start making my own for class and other teachers

Planned Task List:

- ☐ Reimage the Raspberry Pi and get logged on
- ☐

Useful Reference Links:

- [VIAM site](#)
- [Creating a Rover Raspberry Pi Image](#)
-

What Did We Working On Today:

- Imaged the SD card for a new Raspberry Pi build
- User = Party_Rover-0
- Password Learn
-
- **What Worked - What Steps Did I/We Solve:**
 - Short description of what your team did today... Date driven... as you enter entries, keep the latest at the top. Also, whenever you post an update here, also update the Project Resource Page as well...
 - Other things that worked...
- **Challenges, Questions, or Roadblocks:**

List all the current issues that are a challenge and preventing forward progress on this project

- ☐ Next step..
- ☐ Next Step...

What Will We Work On Next Time?

- ☐ (fill this out at the end of class/open lab activity time)
 - ☐ List your next 2-5 steps or activities.
 - ☐ This is key!!!
 - ☐ You need to be thinking about this project as a whole, and break it down into
 - ☐ small tasks you can complete in 30-60 min
 - ☐ Be sure these items get on your Big list
-

STEAM Clown's Getting Started Guide

Build a Rover Platform

Build a Raspberry Pi 3B Image

Following the instructions found on the [VIAM site for the Raspberry Pi - 3B image build](#).

- Image with Raspberry Pi OS (64-bit Desktop - Bullseye)

What you need:

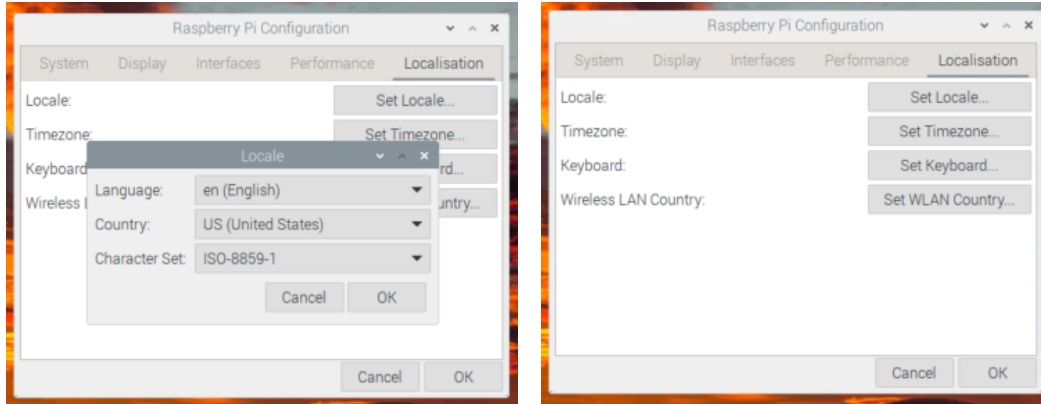
- "Computer" on your rover, in this case a Raspberry Pi3B with the 64 bit OS so you can run the the VIAM [RDK](#),
- Rover (define the setup, but it's just a Differential Drive Robot)
- Raspberry Pi -3B (needs to be a 64bit capable device)

Step1 - Build Rover

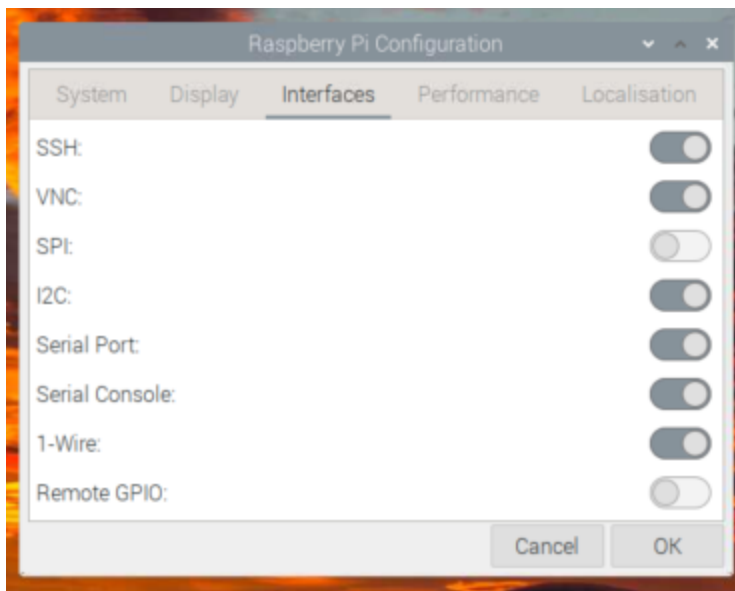
- In this case, I just built a Raspberry Pi 3B image and will add it to a tank tread differential Drive later.

Step2 - [Build Raspberry Pi Image](#)

- You will need:
 - Raspberry Pi -3B (needs to be a 64bit capable device)
 - A microSD card - 32G -64G recommended - and a way to connect the microSD card to the computer (microSD slot or microSD reader)
 - An internet-connected computer (Windows 11 is what I'm going to use for the initial setup)
- Get the Raspberry Pi Imager and follow these [setup instructions](#)
 - Add all these steps later here...
- Install the SD card and if you can Boot with Keyboard, Video, Mouse (KVM)
 - make sure all the localization settings are set



- Make sure the following Interfaces are turned on:
 - ssh, vnc, I2C, Serial Port, Serial Console & 1 wire



- Reboot

Step3 - Update the Raspberry Pi image

- make sure you have all the apps expected on a VIAM robot. I'll update the list I know of here, and add them to a shell script
 - `sudo apt install curl`
 - `sudo apt install git`
 - `sudo apt install arduino`
- My basic new linux image build shell script is linked to this script on my GITHUB
-

Step4 - Install and Run viam-server

- Update and create a new robot
 - go to <https://app.viam.com/try> and setup a new rover
 - <https://app.viam.com/robot?id=0c1eaecf-10e2-4c26-a94c-4a21285dd1be&tab=setup>
 - setup a new rover, and ran the 2 commands on the setup tab, including the curl command with the secret and the curl to install and run the viam-server....
 - OK, when I installed curl, it told me that libfuse was obsolete and could be removed, but apparently the viam-server needs it. I ran `sudo apt install fuse` and then re-ran the setup commands and it worked... so don't follow the curl install instructions to remove the libfuse stuff.
 -
- Following the instructions on setting up a Rover

Build a Raspberry Pi-4 Image

Following the instructions found on the [VIAM site for the Raspberry Pi - 3B image build](#).

- Image with Raspberry Pi OS (64-bit Desktop - Bullseye)

What you need:

- "Computer" with Linux to run the VIAM [RDK](#),
- Rover (define the setup, but it's just a Differential Drive Robot)
- Raspberry Pi -4 (needs to be a 64bit capable device, so while RP3 may work, it may be underpowered... I'll test it later)

Step1 - Build Rover

-

Step2 - [Build Raspberry Pi Image](#)

- You will need:
 - Raspberry Pi 4 - Raspberry Pi running a 64-bit Linux distribution
 - A microSD card - 32G -64G recommended - and a way to connect the microSD card to the computer (microSD slot or microSD reader)

- An internet-connected computer (Linux Ubuntu 22.04 is what I'm going to use) (but also a Win 11 laptop)
- Get the Raspberry Pi Imager and follow these [setup instructions](#)
 - Add all these steps later here...
- Install the SD card and if you can Boot with KVM
 - make sure all the localization settings are set
 - in settings verify that ssh, vnc, and i2c and other interfaces are set
 - What is the list for typical Rovers?
 - I set the following:
 - all of them
 - SSH
 - VNC
 - SPI
 - I2C
 - Serial Port
 - Serial Console
 - 1 wire
 - Remote GPIO ← what are these?
- Following the instructions on setting up a Rover
 - <https://docs.viam.com/installation/#detailed-installation-instructions>
 - But here is the tricky part... if you watch the Video, then you see that you are SSH'ing into "Your Computer" which is your pi... but using the Browser interface on your Linux box...
- Reboot
- make sure you have all the apps expected on a VIAM robot
 - sudo apt install curl
 - sudo apt install git
 - sudo apt install arduino
 - sudo apt install conky
 - sudo apt install vokoscreen - check this out...
 - check these out too...
https://medium.com/@apurva_35716/top-10-raspberry-pi-apps-packages-for-electronics-engineers-fb6ed471051d
- Update and create a new robot
 - go to <https://app.viam.com/try> and setup a new rover
 - <https://app.viam.com/robot?id=0c1eaecf-10e2-4c26-a94c-4a21285dd1be&tab=setup>
 - setup a new rover, and ran the 2 commands on the setup tab, including the curl command with the secret and the curl to install

and run the viam-server....

- OK, when I installed curl, it told me that libfuse was obsolete and could be removed, but apparently the viam-server needs it. I ran `sudo apt install fuse` and then re-ran the setup commands and it worked... so don't follow the curl install instructions to remove the libfuse stuff.

-

-

-

-

- Following the instructions on setting up a Rover

-

<copy text between these lines below>

<Date> <Title - Daily/Weekly "Blog" Project Title - compelling, descriptive title>

What Is The Plan Today:

Tell a short story about what you wanted to do today... Write a short paragraph of today's Project Goals...25 words

Planned Task List:

- ☐ List each
- ☐ Task you are trying
- ☐ To accomplish today

Useful Reference Links:

- List any links related to today's work
-

What Did We Working On Today:

- Enter class lecture notes, Team notes, Discussions and Brainstorming topics here. Describe the steps/challenges you are working on. Make sure you describe how you set up the experiment, how you executed it, and all the materials you needed to do it. Spend time writing your "reflections". Sometimes more important than the actual results, are your thoughts on "why" and "how". Here is where you accurately describe both the success and failures.
- If you make mistakes in the data collected, document the mistake and highlight it with a comment, so you don't lose the work. Don't just delete it. Where did you get stuck? A detailed description of issues you got stuck on or did not understand.
- Include pictures, Code or links to Code, and links to reference material.
- **What Worked - What Steps Did I/We Solve:**
 - Short description of what your team did today... Date driven... as you enter entries, keep the latest at the top. Also, whenever you post an update here, also update the Project Resource Page as well...
 - Other things that worked...
- **Challenges, Questions, or Roadblocks:**

List all the current issues that are a challenge and preventing forward progress on this project

 - ☐ Next step..

☐ Next Step...

What Will We Work On Next Time?

- ☐ (fill this out at the end of class/open lab activity time)
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 - ☐ This is key!!!
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-

<copy text between these lines above>

2021-2022 Team Members: Evan Tran, Viet Bui

Backup Template

<copy text between these lines below>

<Date> <Title - Daily/Weekly "Blog" Project Title - compelling, descriptive title>

What Is The Plan Today:

Tell a short story about what you wanted to do today... Write a short paragraph of today's Project Goals...25 words

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- ☐ List each
- ☐ Task you are trying
- ☐ To accomplish today

Useful Reference Links:

- List any links related to today's work
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describe how you set up the experiment, how you executed it, and all the materials you needed to do it. Spend time writing your "reflections". Sometimes more important than the actual results, are your thoughts on "why" and "how". Here is where you accurately describe both the success and failures. be sure to make entries, so that it is clear who worked on what part of today's entry.

- If you make mistakes in the data collected, document the mistake and highlight it with a comment, so you don't lose the work. Don't just delete it. Where did you get stuck? A detailed description of issues you got stuck on or did not understand.
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 - ☐ Next Step...

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<copy text between these lines above>

Historical Team Members:

2022-2023 Team Members: