CTI
S2024

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Jan4 (Thursday) First Day of the Work.

Meeting (Leadership Circle). HL, YY.

1. 2024 Payscale Update, the guideline 30~40% for 2024 product Development Effort from YY.

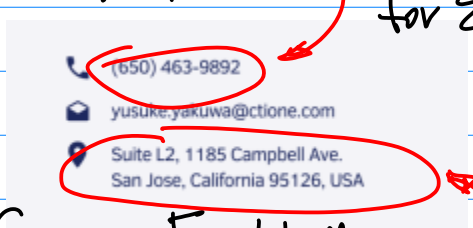
2. Update ON Company Website Development, In the process Review Contract for SF. Based Professional Website Dev. Service.

Focus on W100 Only.

- E-commerce
- Shipping
- Technical Support

Expect to Sign the Contract Jan5. or so.

3. Company phone — Setup phone for Each Department



4. Company Facility A

Facility A: Integration. Shipping Orders. San Jose (Not Hayward Anymore)

Facility B: Machining etc. S.F.

Facility C: Palo Alto.

5. Manufacturing.

Goal: To Be Able to manufacture W100 to 100~200 units/yr. Locally.

(1) Materials Acquisition, Done. San Jose

(2) Cutting/Size the material pipes. Done. Machine @ F.C.

(3) CNC Maching. { F.C. Done / F.B.

(4) CAD Design. 2D. Design. Coding. gcode Done

3D Design. FreeCAD. for Adv. Design is enabled;

(5) Lathe Machine. Done. @ Facility C. and B

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Try.

⑤ Welding. Electric Done. @ F.C.

Equipment, Ready for Testing F.C.

⑦ Power Coating. Painting.

Construction of the Painting Shop. Done, Jan. 3.

Luis.

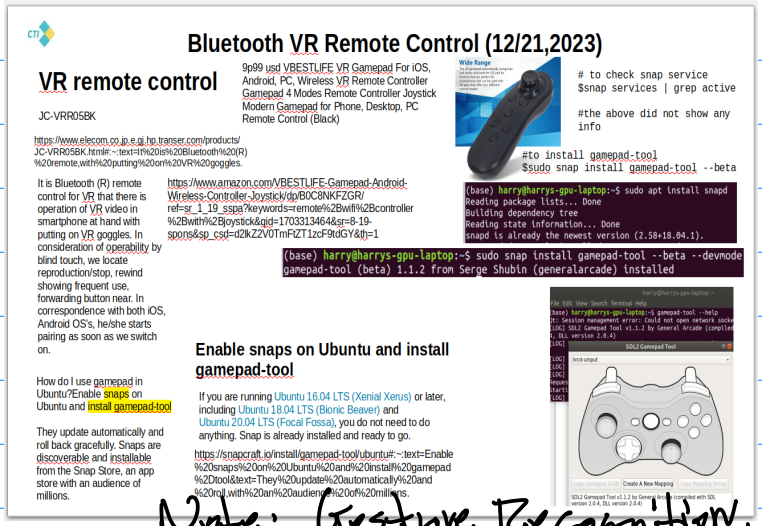
Installation of the filtering System for Environment protection and worker protection. Done.

⑧ IrDA Based Paint Bake Facility is under construction.

To Be finished By Friday @ F.C.

6. Software

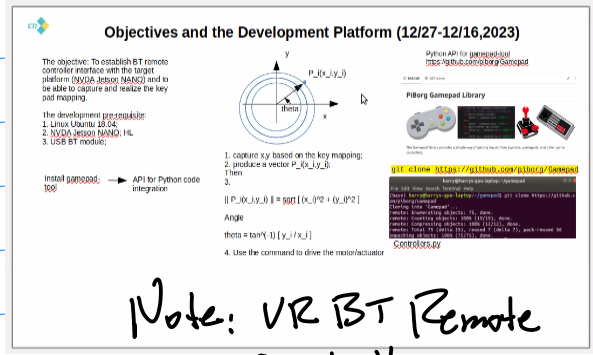
- Task List Updates. YY.
- New Features
  - Remote Control.
  - Facial Recognition.
    - Gesture Recognition. YZ. → Repeat.



Note: Gesture Recognition. July 2023. HL, YZ, ~~github Code~~ → YZ

Jan 8 (Monday) Leadership Circle Meeting, HL, YY, SJ

1.



Note: VR BT Remote Controller Critically Important Priority Item for the LA Tradeshow.

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Note: Normalize S2024
the magnitude, e.g. The Circles.

$R_{max} = 1$, for $R \in [0, 1]$

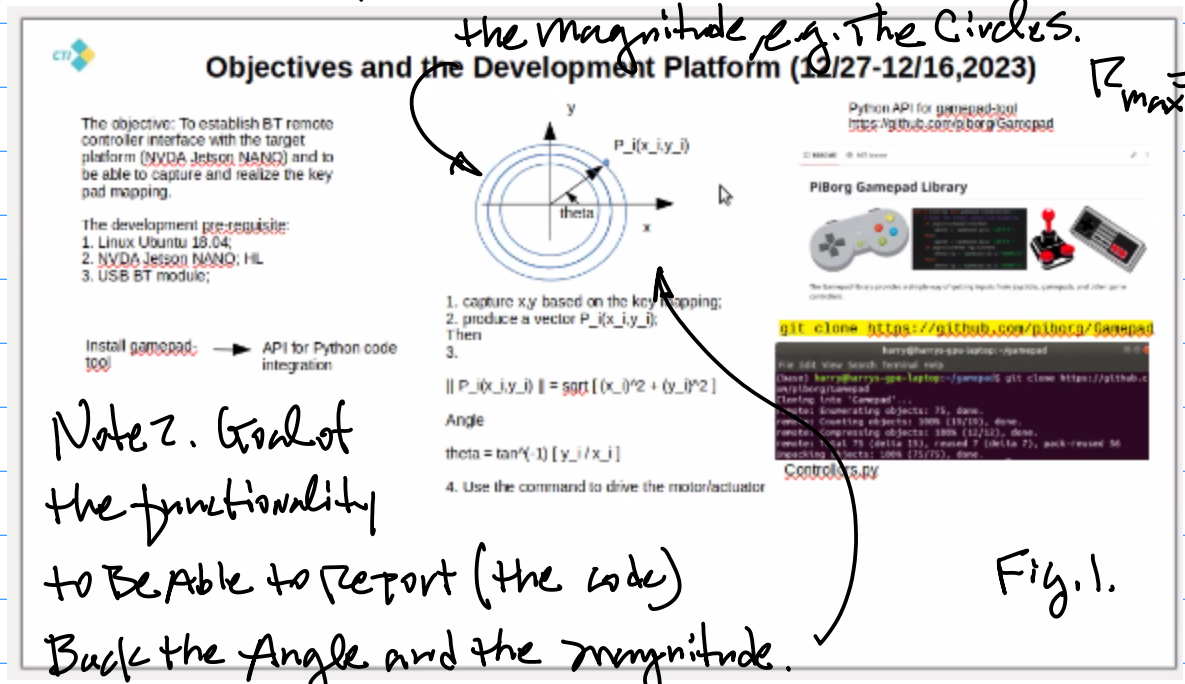


Fig. 1.

Note 2. Goal of the functionality to be able to report (the code) back the Angle and the magnitude.

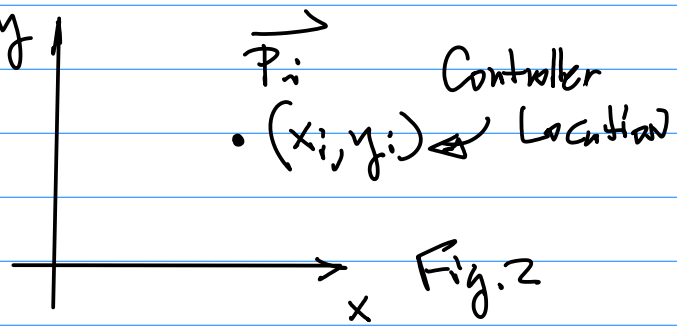
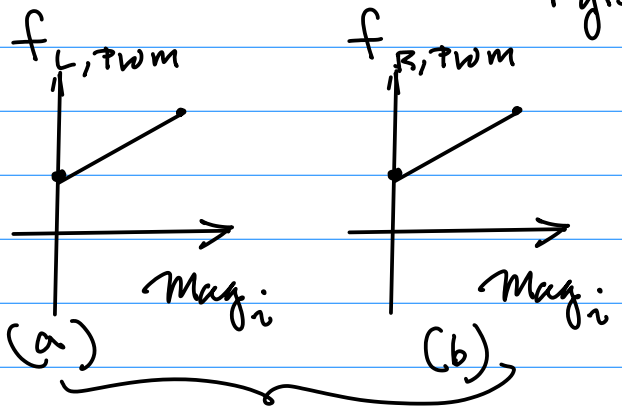


Fig. 2

Fig. 3



Speed & Direction Control

$$Mag._i(x_i, y_i) = \sqrt{x_i^2 + y_i^2} \quad \ldots(1)$$

$$\theta = \tan^{-1}\left(\frac{y_i}{x_i}\right) \quad \ldots(2)$$

2. Gesture Recognition.

Facial Recognition + Command in different forms (One of gesture Recognition)

The Above information will be mapped to PWM Control.

Eqn(1) & (2) $\xrightarrow{\Phi}$ PWM Control.

a. $f_{L,PWM}, f_{R,PWM}$

b. $Duty_{L,PWM}, Duty_{R,PWM}$

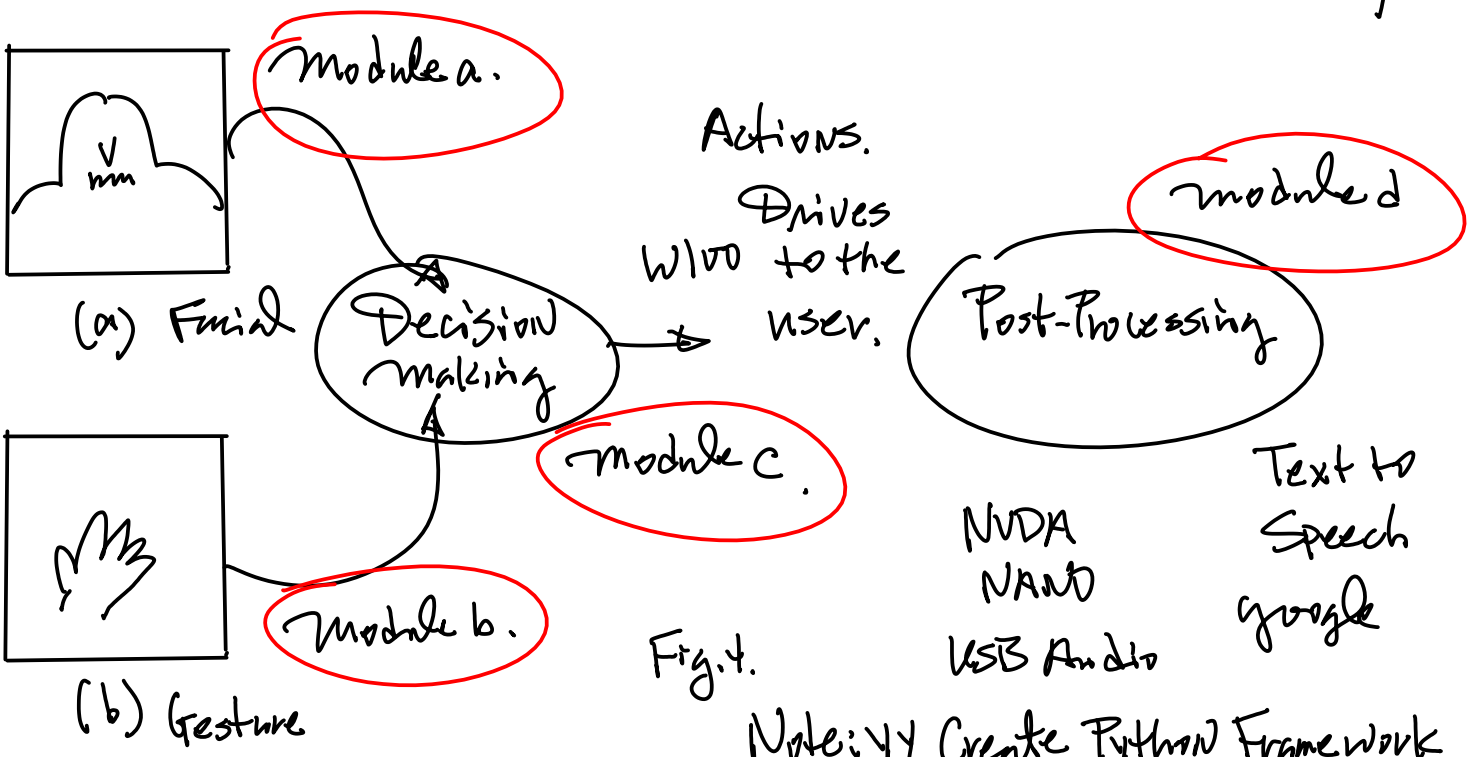


Fig.4.

Note: YY Create Python Framework.
Time Frame: 1~2 Days for the working of github code.

Note: Kai DU github coding.
YY, HL (30% or 40% of the coding Time on this)

Risk: Android/iOS Apps on Task Document, Power up the System, Pair up the Wifi via B.T. etc. Are tested/Approved.

App's Tests/Approval Process
Dr. Srba, Gavin Both are invited to the test Run.

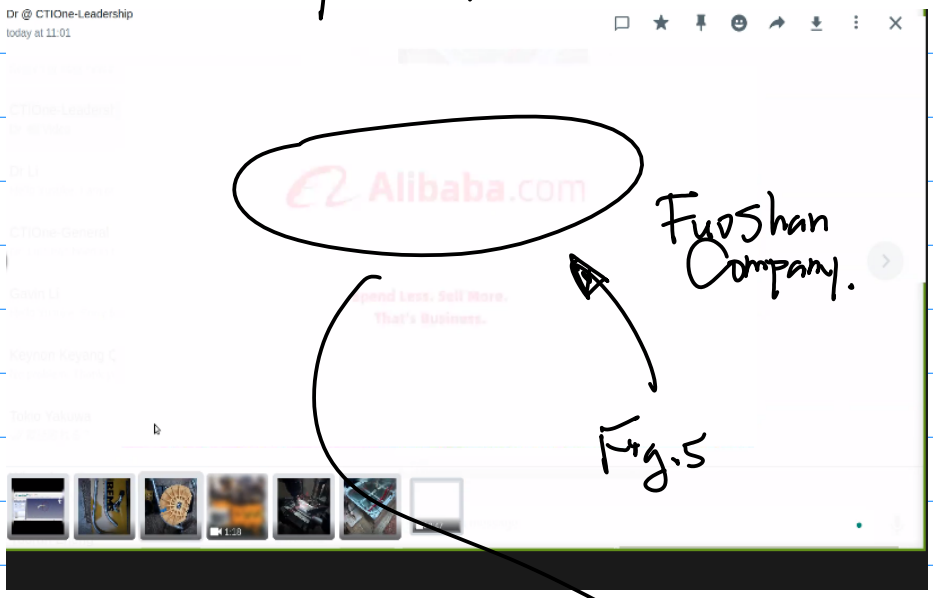
Time: Jan. 30 (Tue), 5:00pm.

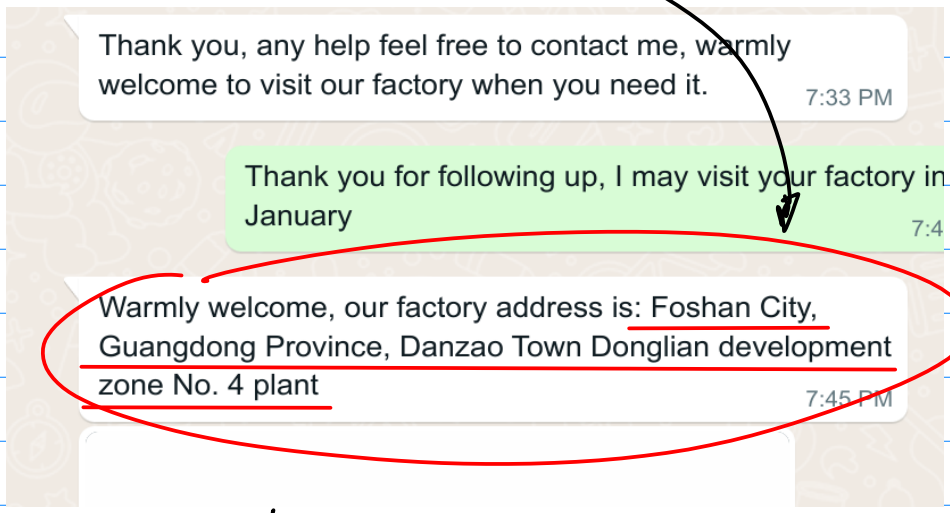
Note: Call meeting. to Arrange
YY. github Code Task for Kai.

3. Manufacturing.
Progress Report/News Letter for the Company Industry Advisor. HL.

4. Trip to China.
(1). Motor Company in HENAN.
Pricing, Quality, Delivery.
(2) GuangDong, SZ. Dongguan, Fuoshan 1#44
Wheelchair/Collator Company.
(3) Winding Down/Close Down BJ Company. No ops Since 2019. May Need multiple Trip.
Fly.

Note: Fuoshan Rollaton Company Visit for OEM/ODM. Potential.





(4) Shanghai/Jiangsu Automation of Welding, Welding Robots. FD100. Suzhou.

(End of the meeting)

Feb 2nd (Friday). HL, SK.
Meeting on 485 Testing.

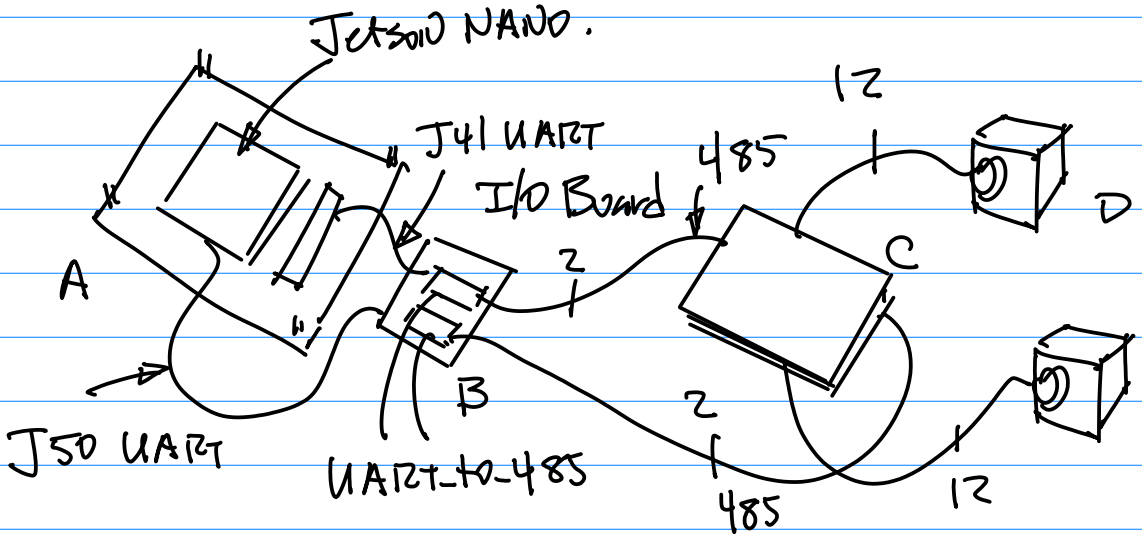


Fig.1.

Tests Between A and B.
Note: UART (J41, J50) Tests.
Then, 485 Conversion from the UART.

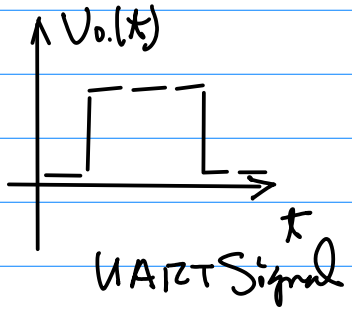
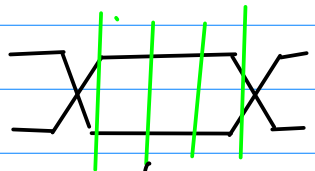


Fig.2.



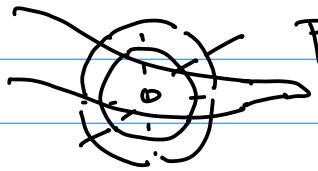
@ the Output of B.

Assume 485 Conversion works.
then, Connect the 485 Cable to the motor Controller, C.

CAN Bus Protocol
Sample code for the testing Based on the CAN protocal.

March 26 (Tue). W02 motor mounting mechanism.

Fig.1a Existing Passive Wheel



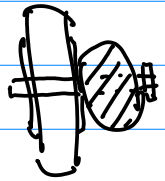


Fig.1b.

Single shaft motor and its mounting mechanism.

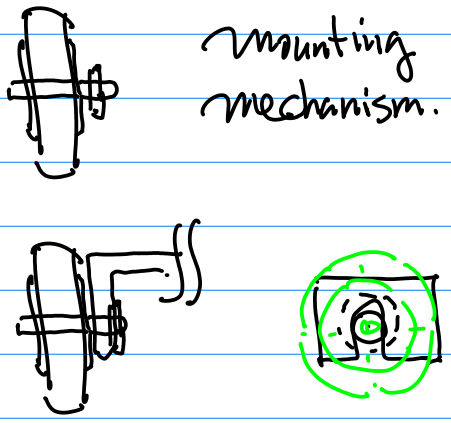


Fig. 2 Note how is the Single shaft motor mounted Dn to the fixture Bracket.

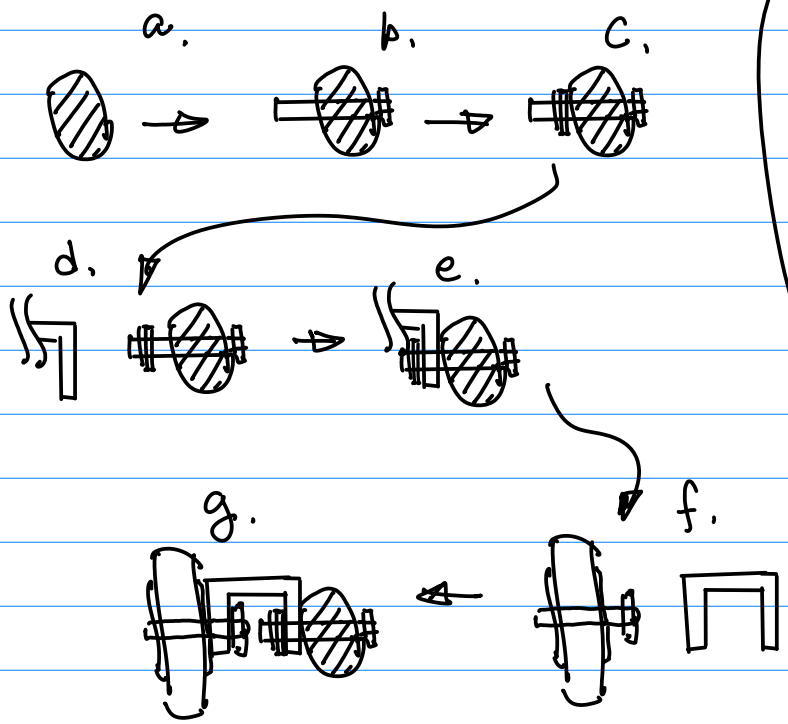
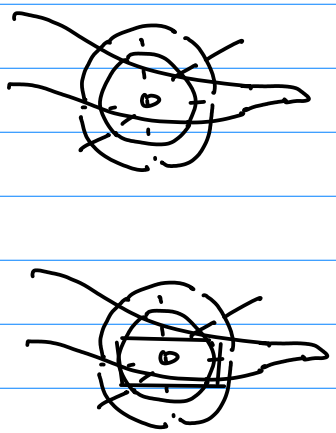


Fig. 3. a. The cross section of the Rollator Beam; b. the mounting screw Penetrating the Beam; C. The Screw is secured Dn to the Beam; d. the Bracket and the Beam Cross Section with the mounting screw. e. Assemble the Bracket; f. The Single shaft motor and the mounting Bracket; g. The Assembly of the motor on the Beam.

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April 10 (Wed). HL. 101

Summary of the Different Devices.

- Motion
  - Walking: Forward/Backward motion
  - Lift: Up & Down motion
- Stabilization/Balance Mechanism

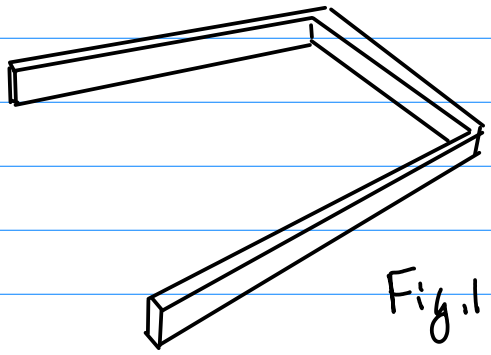


Fig. 1

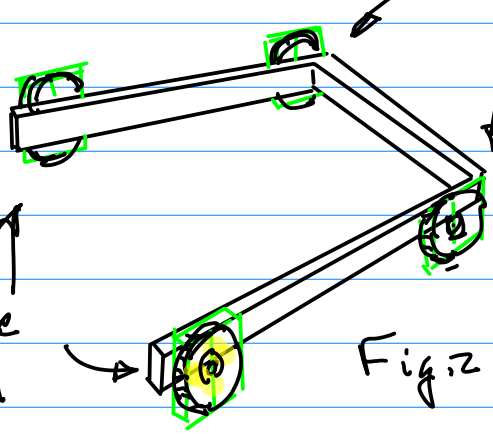


Fig. 2

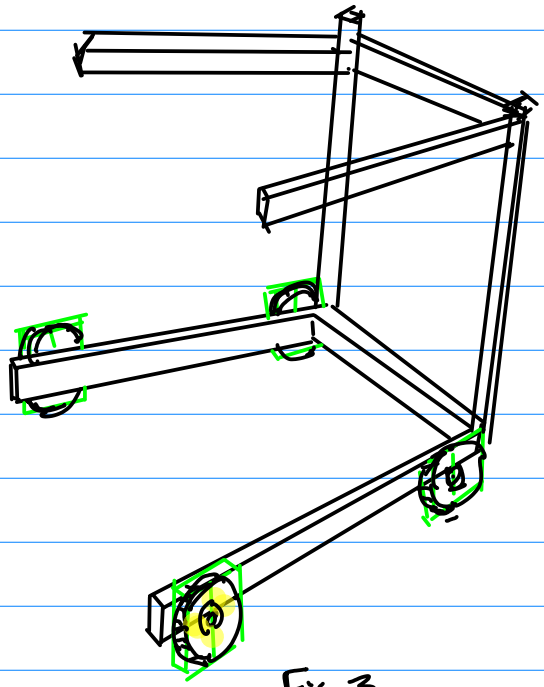


Fig. 3

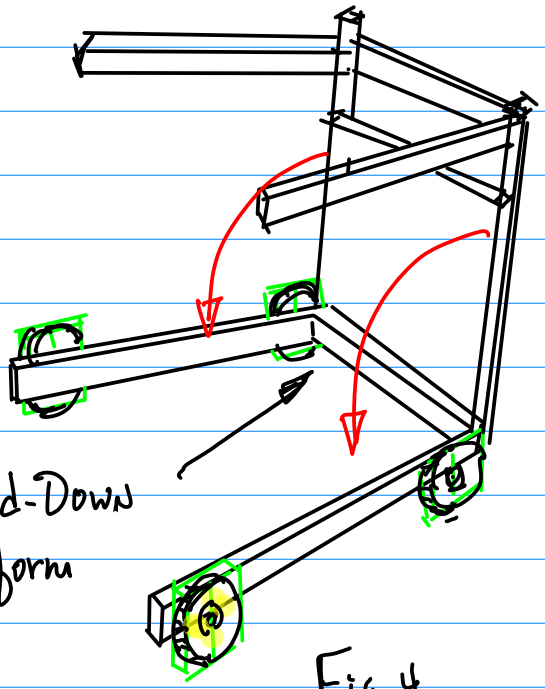
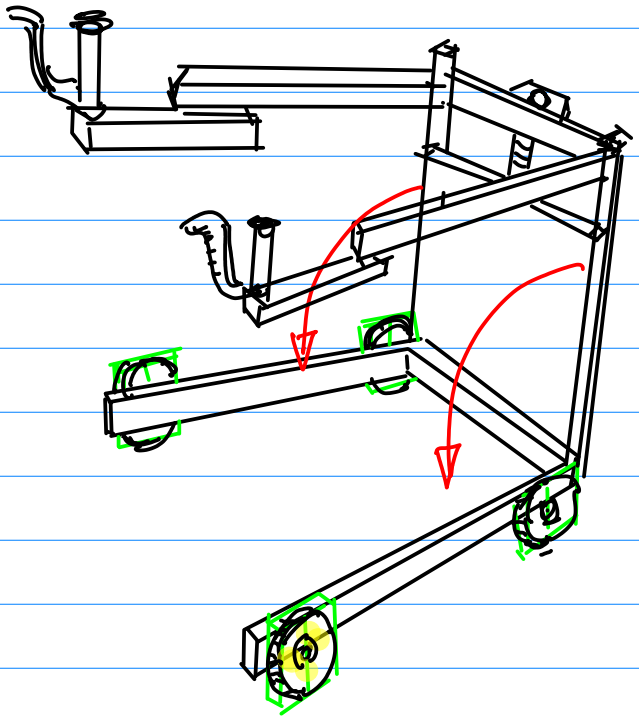
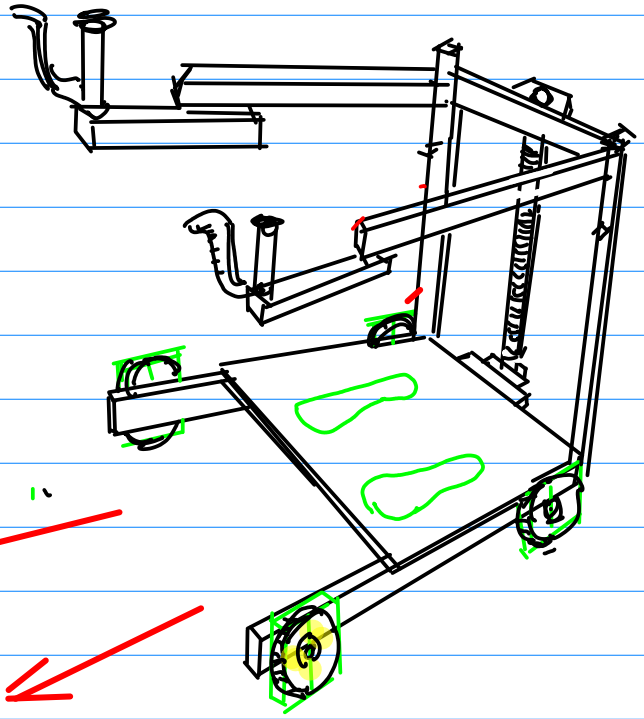


Fig. 4



Walker/Rollator

Fig 5



Standing-up Transporter

Fig. 6

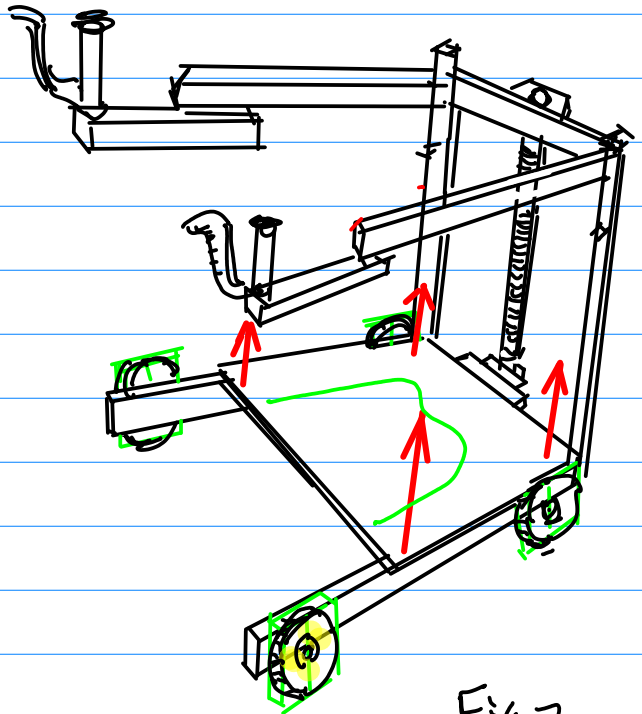


Fig. 7

Fall-Down Lifter

April 11 (Thu). HL, YY, Yifei

$I(x,y,t)$: $M \times N$ ... (1)

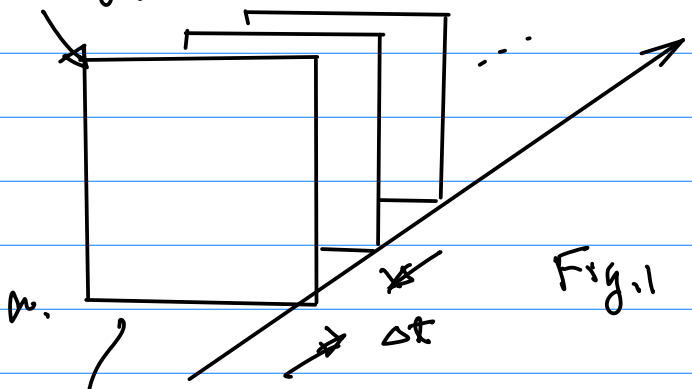
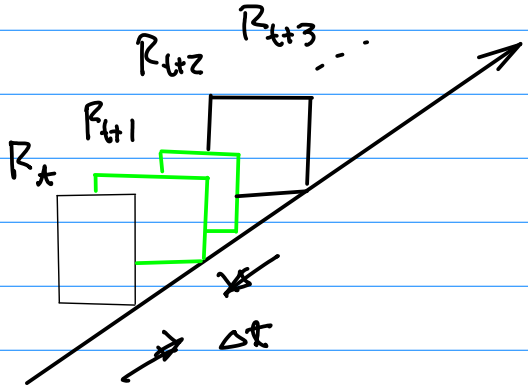
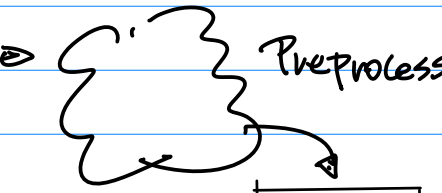


Fig.1

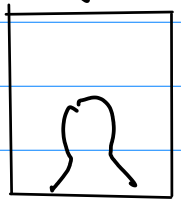
Define

$\dim[R_t] = (m,n)$ ... (2)



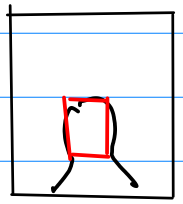


$I'(x,y,t)$



Different Aspect Ratio Resize

b.



ROI

$R(x,y,t)$ or $I_R(x,y,t)$

c.

So, the Sequence of $R(x,y,t)$

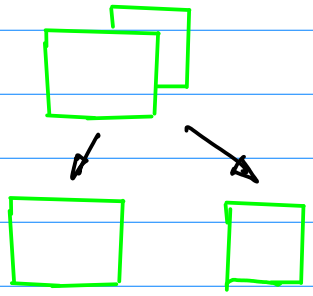


Fig.3

R'_{t+1} R'_{t+2}

R'_{t+i} : Alternative ROI images

Process Time

$T_{Pro}(R') \ll T(R)$ ... (3)

Step1. OpenCV : $I(x,y,t)$

Step2: $Hist(I(x,y,t))$

$I_{his}(x,y,t) = Hist(I(x,y,t))$ ... (4)

Step3:

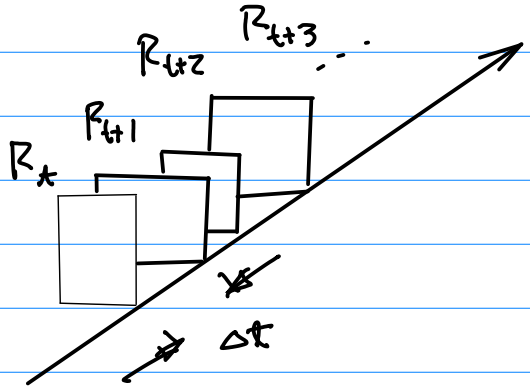


Fig.2

$T(R_{t+i})$:

Time To Process Each R_{t+i}, for $i=1,2,\ldots$, is about 40ms.

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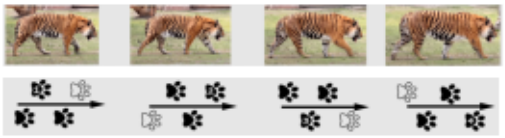
August 1 (Th) HL, Jackson, Eric

Note: Develop Visualization Tool. in Python.

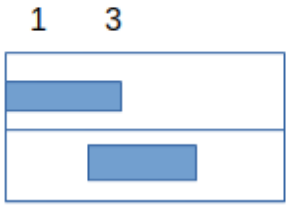
Gait Pattern Visualization (7/26-5/22, 2024)



	Back	Front
Left	BL (1)	FL (2)
Right	BR	FR

https://www.animatornotebook.com/learn/quadrupeds-gaits

Footfall order: BL FR BR FL (Define the each foot)



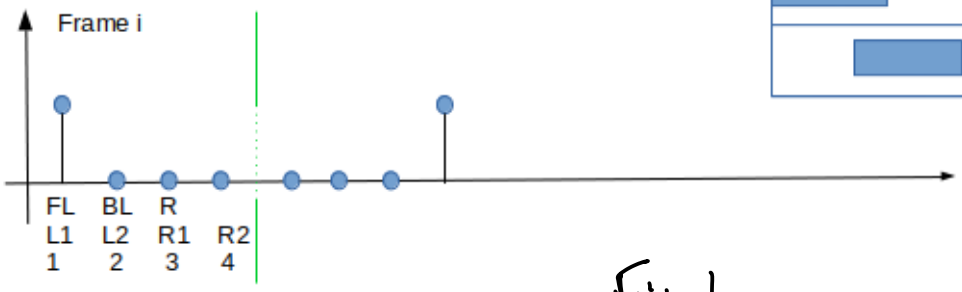


Fig. 1

From Jackson's ROS Simulator

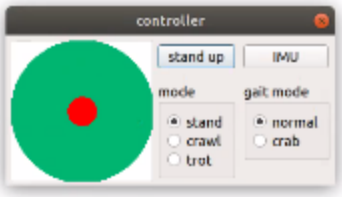
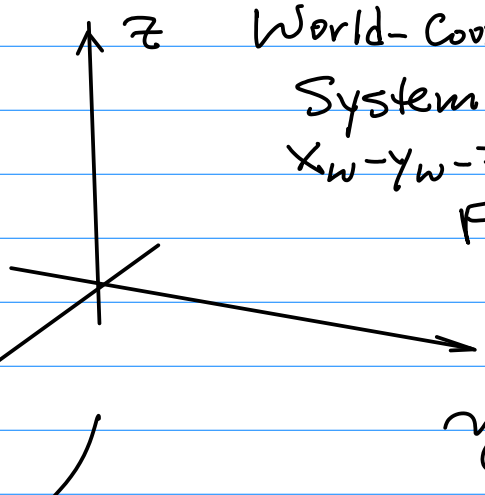


Fig. 2



World-Coordinate System. x_w-y_w-z_w

Fig. 3

Note 2: Stick Diagram of the Quadruped Robot

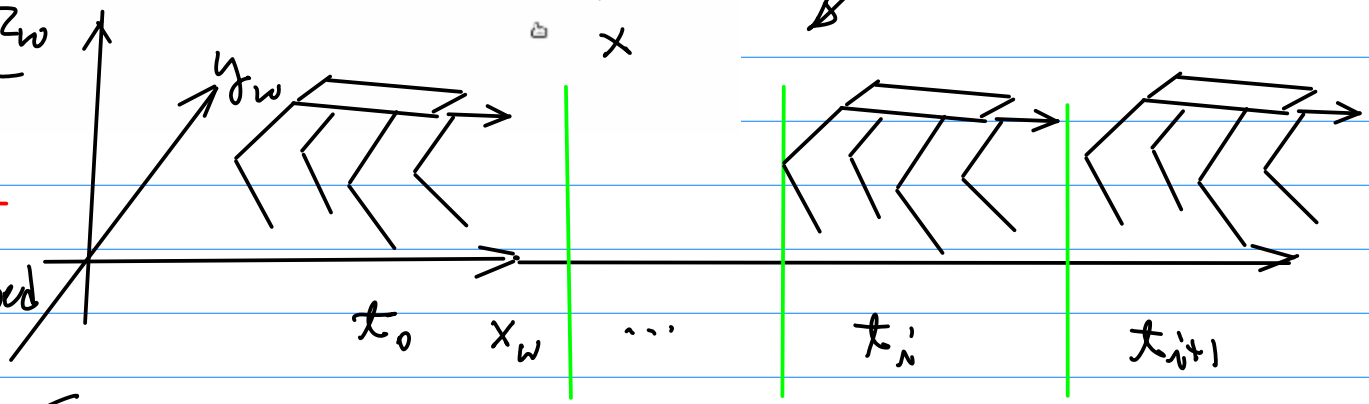
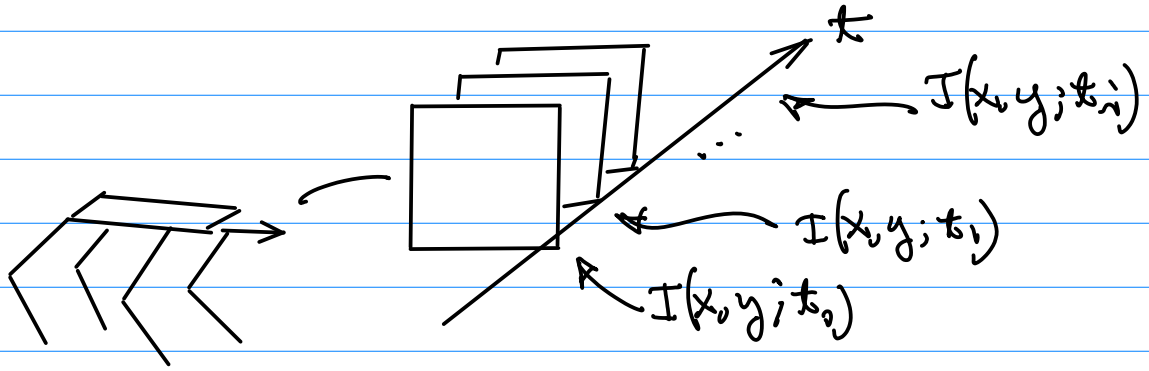


Fig. 4.

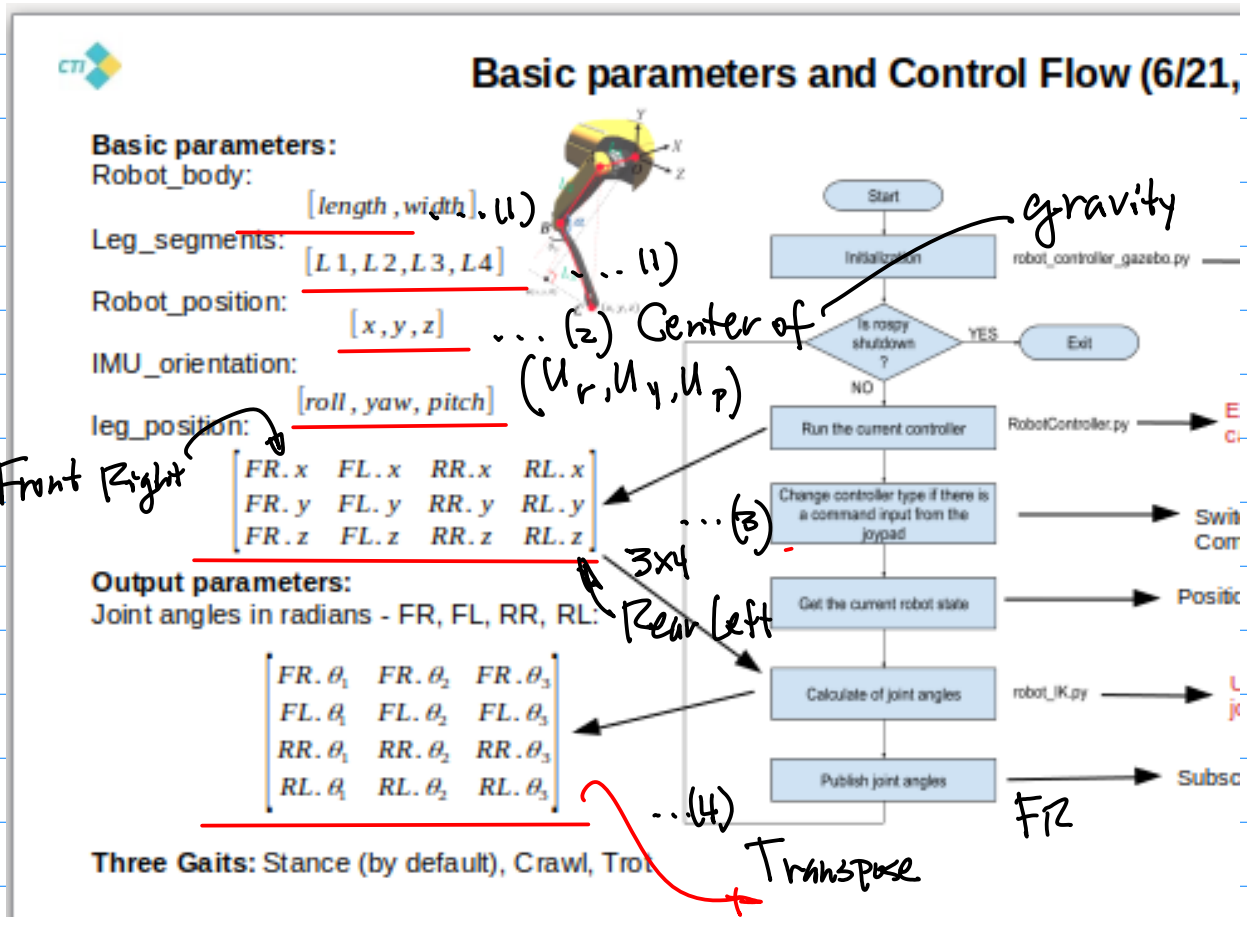
Note 3. Capture the Images of the Leg motion.



Features: 1° Capture Each Leg

Position @ time t_i, $i = 0, 1, 2, \ldots$

Vectors: Define 1st Vector



$$\begin{bmatrix} FR_{\theta_1} & FL_{\theta_1} & RR_{\theta_1} & RL_{\theta_1} \\ FR_{\theta_2} & FL_{\theta_2} & RR_{\theta_2} & RL_{\theta_2} \\ FR_{\theta_3} & FL_{\theta_3} & RR_{\theta_3} & RL_{\theta_3} \end{bmatrix} \quad \cdots (4\text{-}6)$$