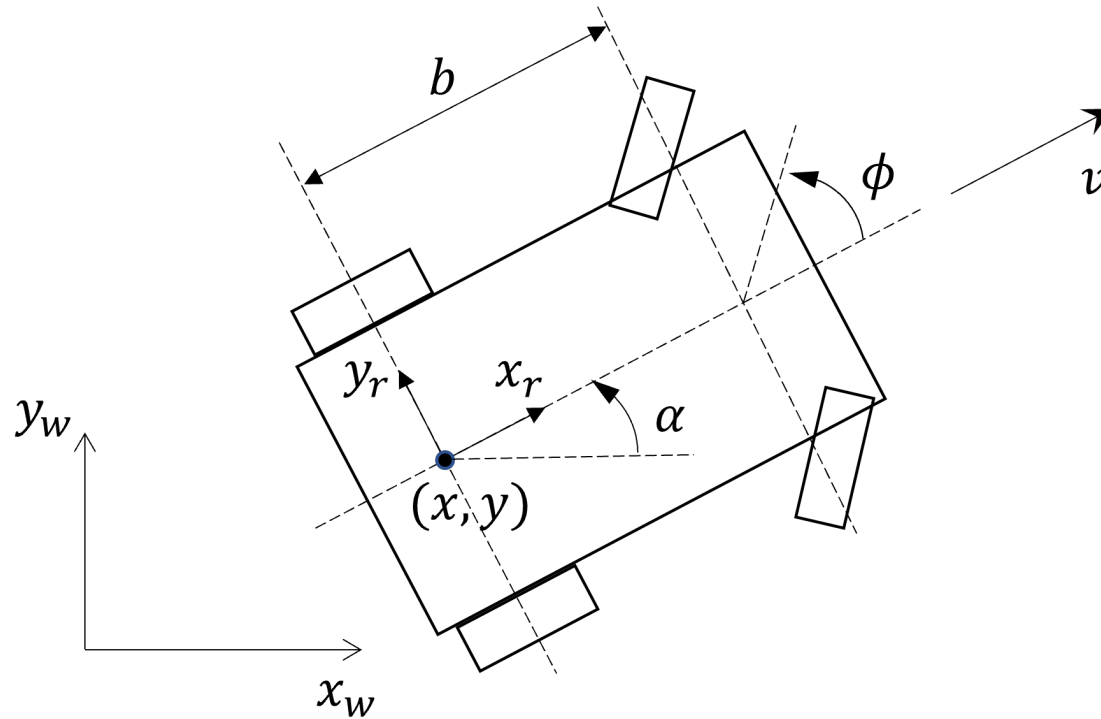# Final Project

ENPM633

Car Like Robot

$$\dot{x} = v \cos \alpha$$

$$\dot{y} = v \sin \alpha$$

$$\dot{\alpha} = \frac{v}{b} \tan \phi.$$

The control inputs to this model is $u = [v, \omega]$, where $\omega \triangleq \dot{\alpha}$ is the rotational speed of the robot. These can be transformed to the command actions (v, ϕ), where v is the translational speed and ϕ is the steering angle obtained by $\phi = \tan^{-1}(\omega b / v)$.

Instructions

- Training Data with instructions on format of data (see readme file) are available at

- https://drive.google.com/drive/folders/1IgiPMaMyktjIa9qH-5qqSjwFuew9TiPW?usp=sharing

- Test data is available at

https://drive.google.com/drive/folders/1IhVbX1VwAQf4WzamN8m81sNQTABDWw5y?usp=sharing

Deliverables (Due Dec 16, 11:59 pm)

- Final Report (Online Submission)

- Prediction Model and Evaluation. The rationale for choosing a given model should be provided and discussed in detail. What steps were taken in the learning process for the model selection? How was regularization done? What was validation used for? Please provide detailed discussion. Learning Curve, Validation Curves should be provided. The process for selection of various hyperparameters should be detailed.

- Estimate for the out of sample error from the test data.

- Code used for generating the predictor.

- Final Presentation (6-10 slides) should summarize these findings.

Naming Conventions for the Project

Please use the following naming conventions in your project:

- **report.pdf** - report
- **presentation.pptx** - presentation
- **readme.md** - instructions to run the code
- **code** folder - all the code preferably python scripts (can be Jupyter notebooks)
- **figures** folder - plots for the loss vs epoch, accuracy vs epoch, etc.

Use meaningful variable names, function names, and individual file names in your codebase.

Please don't upload any unnecessary files for example datasets, trained models, references, etc

Please submit the complete document as **full_name.zip**