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1 Stuff

Here is some placeholder content. It is obviously very advanced math. Here, have a Gaussian integral:

$$\int_{-\infty}^a \frac{1}{\sqrt{2\pi}} e^{x^2/2} dx \quad (1)$$

2 Also Stuff

Here is some *more* placeholder content!

3 Even More Stuff

Well, there's even more stuff here!

4 Propulsion

Alice's six Blue Robotics T100 thrusters were reused from last year. Compared to bilge pump motors with which team members had worked in the past, the T100s have superior thrust characteristics and power efficiency. In order to design efficient control algorithms and thruster mappings, the company mathematically modeled the vehicle dynamics with a three-dimensional rigid-body analysis.

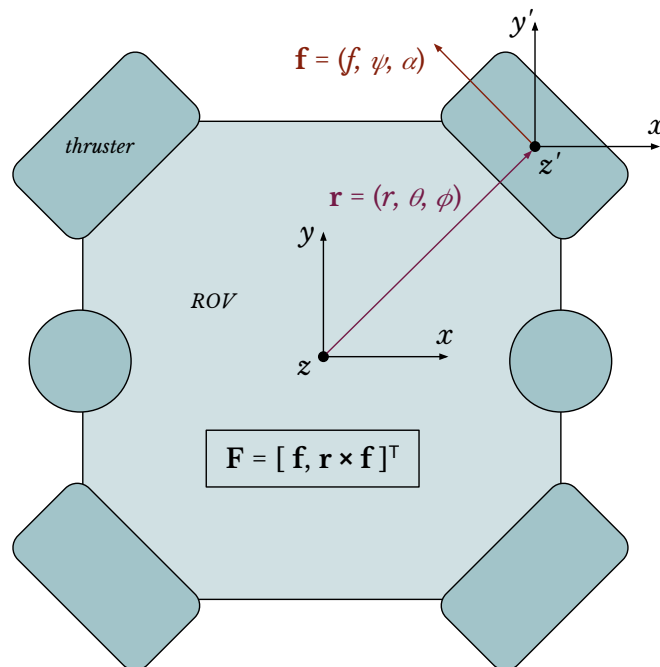


Figure 1: Rigid-body model of an ROV under the influence of a thrust \mathbf{f} at a thruster located at \mathbf{r} .

The relationship between the vector of thruster forces \mathbf{f} is related to the net forces and torques on the ROV \mathbf{F} by $\mathbf{F} = \Lambda \mathbf{f}$, where the structure matrix is:

$$\Lambda = \begin{bmatrix} \sin \psi_i \cos \alpha_i \\ \sin \psi_i \sin \alpha_i \\ \cos \psi_i \\ r_i \sin \theta_i \sin \phi_i \cos \psi_i - r_i \cos \theta_i \sin \psi_i \sin \alpha_i \\ r_i \cos \theta_i \sin \psi_i \cos \alpha_i - r_i \sin \theta_i \cos \phi_i \cos \psi_i \\ r_i \sin \theta_i \sin \psi_i \sin(\alpha_i - \phi_i) \end{bmatrix} \quad (2)$$