

6.5 Jetson Ability to Process Data

The Jetson TX1 contains a quad-core ARM Cortex-A57, which extends the reach of ARM architecture into premium 64-bit mobile and infrastructure applications. The Cortex-A57 features cache coherent interoperability with ARM Mali™ family graphics processing units (GPUs) for GPU compute applications. The Jetson TX1 also contains an NVIDIA Maxwell GPU with 256 CUDA-cores delivering over 1 TeraFLOPs of performance and has 4GB of LPDDR4 memory. The included camera interface is capable of 1400 MPix/s. These technical specifications make the Jetson TX1 a highly desired and competitive piece of technology for processing SLAM algorithms and will contribute greatly towards the success of this project.

6.6 Size of Area Able to Map

Since the ZED Stereo Camera is a new device, we were unable to find information about the size of the files created when the ZED Stereo Camera maps an area. This information will be gathered through future testing and our information will be updated accordingly. Since the Jetson TX1 will be where the files are saved and it has 4GB of RAM with the ability to increase this capacity through the SD card slot, we predict the system should be able to map any area our client desires.

7 Final Design Specifications

The final design specifications are divided into two categories, system requirements and mount design.

7.1 System Requirements

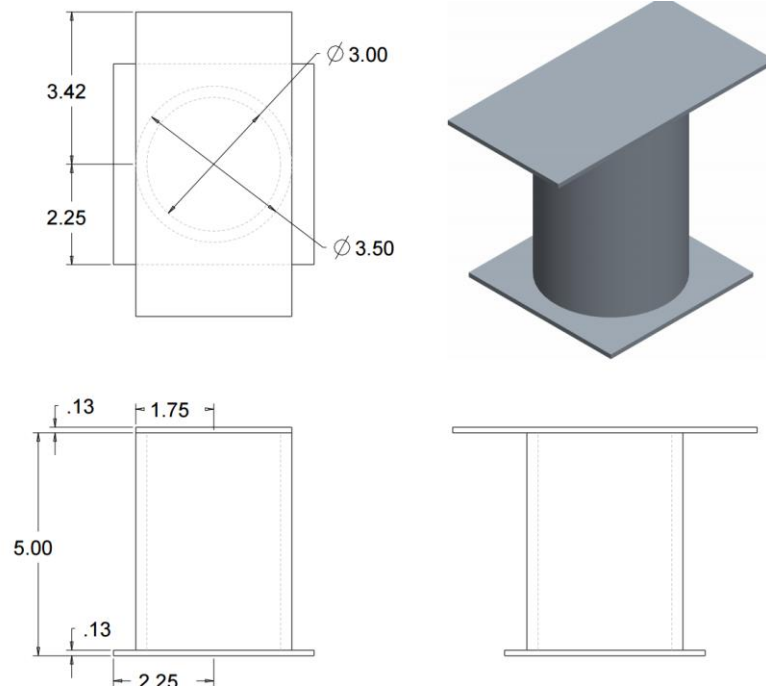
For the ZED and Jetson TX1 system to function properly, all the following hardware and software requirements must be met.

Requirements for ZED Stereo Camera and ZED SDK:

- Dual-core 2.3GHz processor or faster
- 4 GB of RAM
- NVIDIA GPU with Compute Capabilities > 2.0
- CUDA 8.0
- USB 3.0 port with latest drivers
- Windows 7, Windows 8, Windows 8.1 (64bits), Ubuntu 14.04

7.2 Mount

The chosen mount design, Design 2 which can be seen in Figure 11, will be constructed from PVC with an arm length of 5” and a platform width of 7”. The ZED Stereo Camera will be secured to the platform by using a nylon strap. Constructing the mount out of PVC will keep the cost low, \$115, while still meeting all feasibility criteria.



our client

Figure 11: Final Mount Design

8 Budget and Costs

This project requires many components in order to be successful. The client has provided us with Thumper, Pixhawk Autopilot, and 3DR UBlox GPS + Compass Module so they will not be included in our budget analysis. The resources required have been divided into two categories: Financial and Guidance. Without either resource, this project would not be able to be completed.

8.1 Financial

Table 5 shows the cost of the parts for the ZED and Jetson TX1 system, as well as the total cost of the system. Table 6 shows the cost of the materials needed to build the mount and the total cost of the mount.

Table 5: ZED and Jetson TX1 System Budget

Item	Supplier	Price
ZED Stereo Camera	Stereo Labs	\$449.00
Jetson TX1 GPU	NVIDIA	\$599.00
Total Cost		\$1,048.00