

# The Sewer Scout

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## Abstract

- The Sewer Scout plans to solve the need for efficient and clear image inspection systems.
- Most inspection devices out in the market lack clear image of the interior and are manually push through a pipe so we plan to create a better and more efficient design.

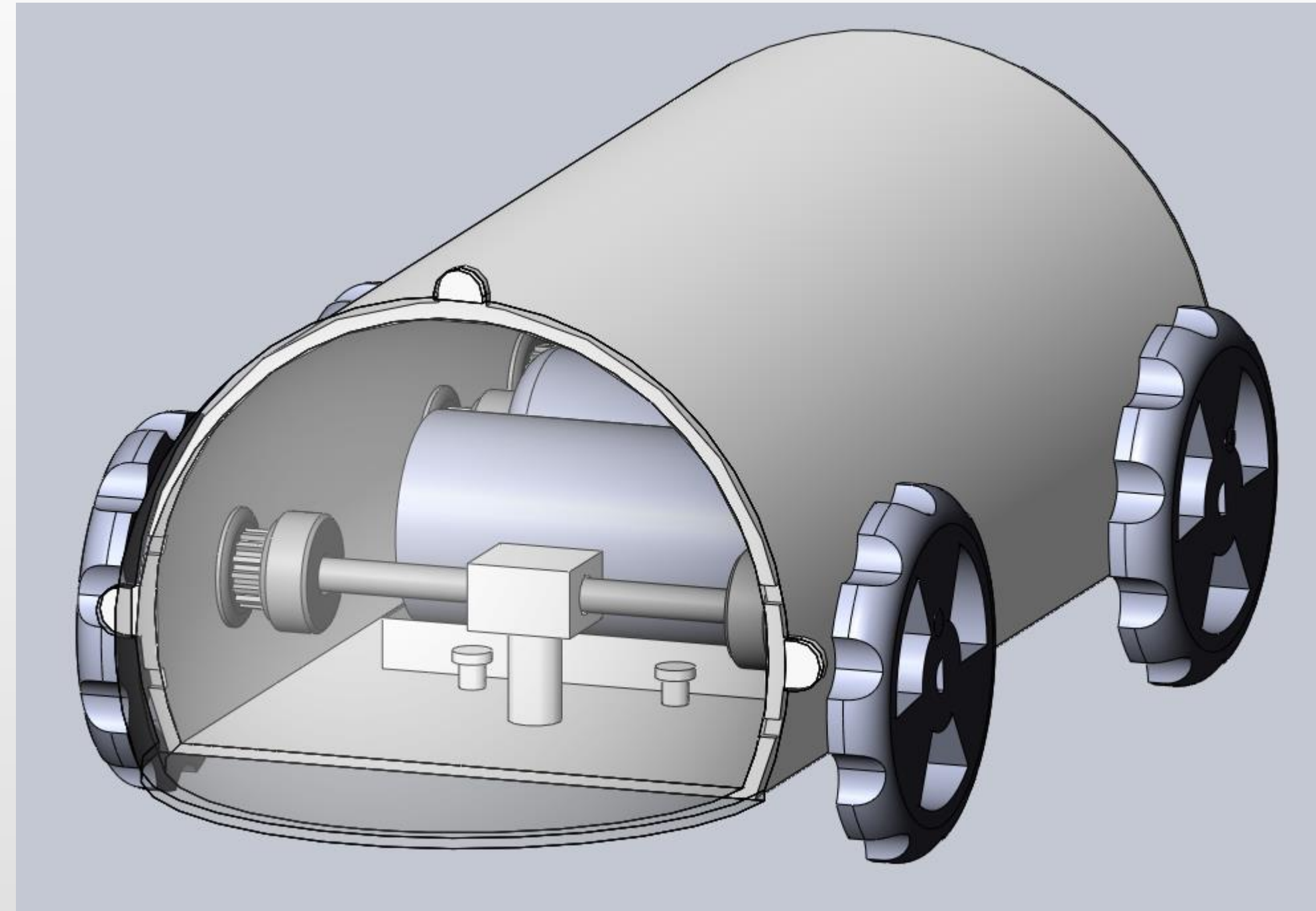
## Functional Specs

- Smaller than 4 inches in width and height
- Must be able to travel minimum 10 feet straight pipe
- Must be capable of transmitting footage back to the user
- Device must stay connected with its tether wires while submerged and traveling

## Methodology

- SolidWorks was used to create the separate components that would then be assembled and allow us to see how each component interacts with each other and get a better sense of the dimensions needed.
- Other specs such as the speed and power were calculated to give us the steadiest and least shaky camera visuals.

## Prototype

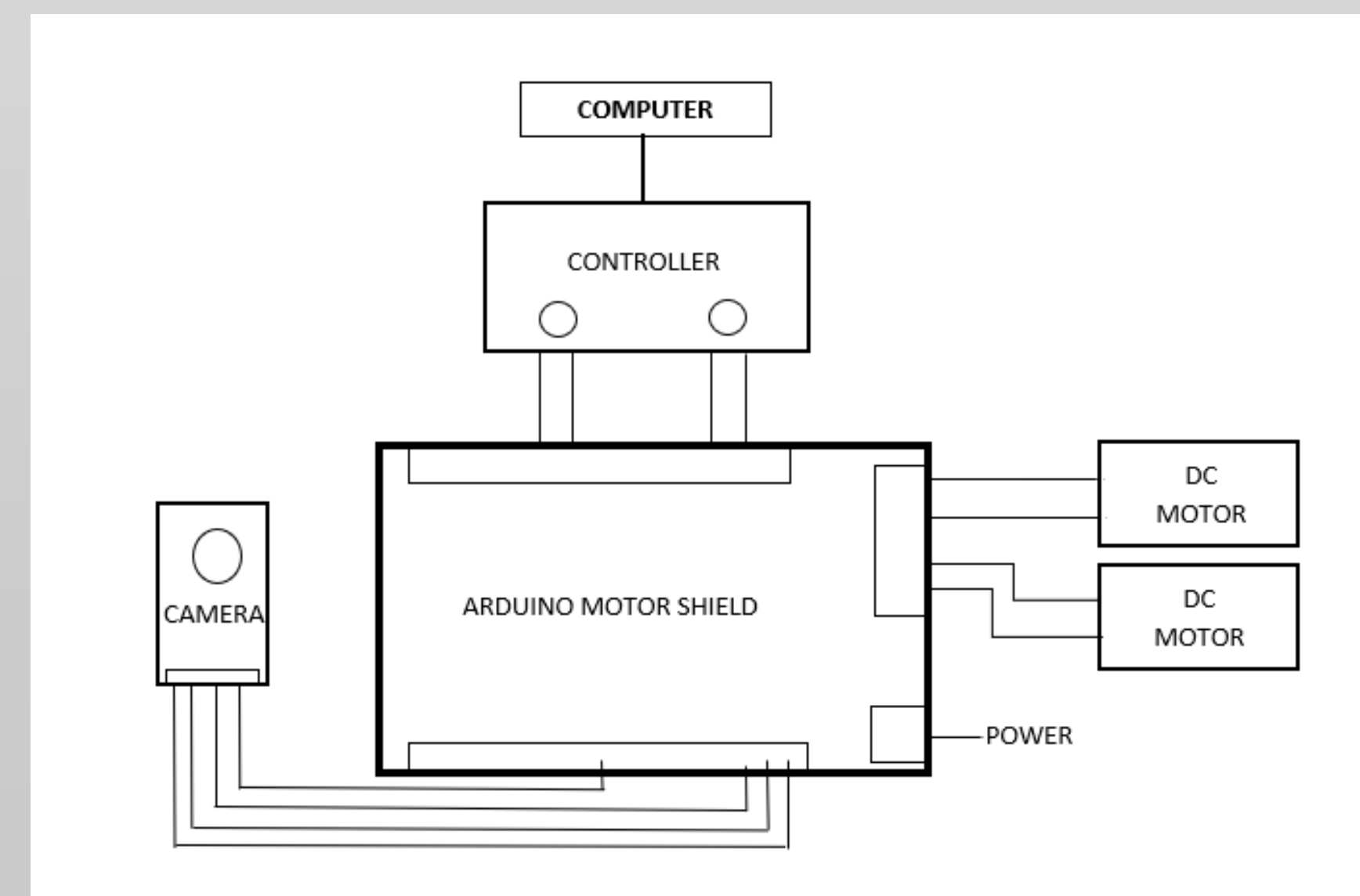


**Sewer Scout 3D Model Assembly  
 (Camera door and timing belts not shown)**

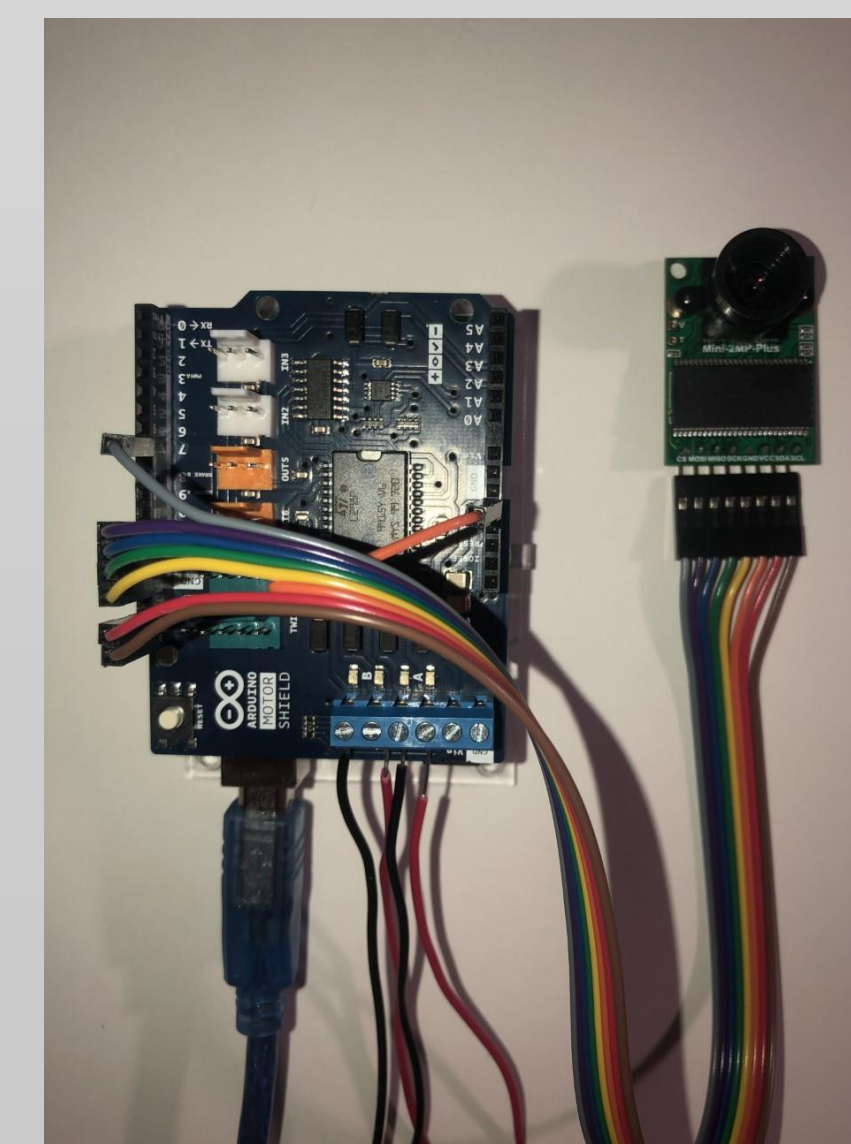


**Two DC motor with sheaves  
 and wire connections  
 (Primary mechanical  
 Component of Sewer Scout)**

## Electrical Components



**Electrical components Connections Flow**



**Arduino Board Connections**

## Result Discussion

- The Sewer Scout had a large number of challenges which affected its final performance some of these included, component malfunctions, mis-planning and lack of testing time.
- Overall, the Sewer Scout performed most of the specs that it previously set out to do with a few exceptions.
- The camera chosen to capture the interior of the pipe, failed to give us the clearest visual live images of the interior but this was mainly due to the quality of the camera we bought.
- Other aspects were more successful such as maintaining the interior of the Sewer Scout from water damage and was able to fit through a 4-in pipe.

## References

[1]Farmani, Raziye, et al. "Pipe Failure Prediction in Water Distribution Systems Considering Static and Dynamic Factors." *Procedia Engineering*, 2017. XVIII *International Conference on Water Districution Systems*, doi:10.1016/j.proeng.2017.03.217.

[2]"The Various Methods Used in Pipe Inspection." *PIPEWORKS*, 24 Feb. 2017, www.pipeworksinc.com/blog/drain-and-sewer-service/methods-used-pipe-inspection/#:~:text=Pipe inspection is a vital,obvious symptoms before taking action.

[3]Wu, W., et al. "Failure Assessment of Cracked Pipes Based on Failure Assessment Diagram Considering Random and Fuzzy Uncertainties." *Elsevier Ltd, Pressure Vessel Technology: Preparing for the Future*, 2015, doi:10.1016/j.proeng.2015.12.300.

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