Large Format Scanner

SLQ Wiki Fabrication Lab 2025/07/02 16:49

Large Format Scanner

(a picture to go here)

https://cdn.thingiverse.com/renders/38/f0/a0/89/5d/12c67337dd6479fcda4e2dcf4554b624_preview_featured.JPG

Intro

This project was developed for :

- Scanning larger objects ... (Human Size)
- Is based on a design sourced from Thingiverse ...

link : https://www.thingiverse.com/thing:729923

Intent is for it to be semi automated, with simple push button operation & computer interaction - saving output file on laptop / usb device ...

More to add here ...

Components

This device uses several components - outline to follow ....

Hardware

Following Materials were used, with dimensions, and quantities. Have broken this down into two parts
- Turntable & camera slide ...

Turntable

- 16mm Plywood sheet (CNC cut) : 1 & 1/2 sheet ...
- Wheel Hub : Toyota ZZE122 (http://www.alliedbearings.com.au/rear-wheel-bearing-hub-assembly-for-toyota-corolla)
- Feet (3d printed) : 10 of ...
- Various nuts & bolts ... (TBA)
- Connecting Shaft : 100 x 50mm RHS Aluminium ...

(more details to add)

Chain Driven Option :

- Chain : Approx 600mm long (I used one from Garage but same as Bicycle)
- Drive gears ...

Shaft Driven Option :

- Shaft drive : 14 mm
- Pillow block : 2 of
- Drive Gear & Coupler
- Shaft : 100 x 50mm RHS Aluminium

Camera Slide

- (TBA) - vertical slide.
- various nuts & bolts.

Electrical

- Power supply : 12v DC/AC
- Various wiring : (TBA)
- Sensor ?

Turntable :

- Turntable Motor + Gearbox (TBA) : Nema 23 with Reduction gear ratio 1:5
- Driver (CNC board) : (TBA)
- Power supply to suit : (TBA)

Camera :

- Kentix PlayStation Camera : (TBA)
- Slide Motor (TBA) : Nema 17
- Driver (CNC board) : (TBA)

Software

Working on controls for this ...

Provisionally see here :

https://www.dfrobot.com/wiki/index.php/TMC260_Stepper_Motor_Driver_Shield_SKU:_DRI0035

https://www.trinamic.com/products/integrated-circuits/details/tmc260a-pa/

http://www.3ders.org/articles/20120807-new-kinect-based-3d-scanning-software-released.html

Notes

Tested the basic software operation on a desktop & laptop : Worked on the computer, but couldn't get it to load on Laptop ...

Computer

There are two sides to the scanning operation, one to scan & other to process : thinking of using a laptop for scanning & larger more capable machine to do the processing. (ideally it should be done on the same machine)

Laptop

Sufficient to run Kinect scanner software ...

Main Processor

The resultant scan will be compiling a large amount of data, so it will be needing a reasonable amount of processing / memory for this something like :

* CPU Processor - 6 core @ 3.2 upto 4.3GHz
* Memory - 32GB DDR4 (2x16GB)
* Storage Drive - 500GB to 1TB SSD
* Graphics Card - Nvidia Quad P1000 4GB

(more to add)

Tools

(List all the tools you used to complete the project, from #1 Philips screwdrivers, to the CNC machine)

Instructions

(This is where you put the step-by-step photos showing how to carry out your project, as well as an explanation in words. Rename the steps as you like, use italics or bold for emphasis.

Don't forget to include design files for CNC, laser cutting or 3D printing but remember they need to be zipped before uploading to the Wiki (it is also useful if they are in a transferable format, .svg rather than .ai, for example)).

Step One:

Step Two:

Step Three:

Step Four:

etc

Development notes

(Some ideas that were tried, but which did not work & and why)

- Tested the Kinect camera & software on large computer - works ...
- Tried on laptop, insufficient processing power - will require higher spec one ...

- Tested the chain drive system, found problems with motor & chain not engaging & falling off ... (Do note the Chain is not designed to run horizontal ! ...)

- Research a system to run a prototype shaft drive ...
- Now working on a shaft driven option, will add more as it progress ...
- Drawn up & making shaft drive system ...

- Control panel operation ...

Feedback

(Here you can put any suggestions from users that you have not yet implemented, and mention any unforeseen difficulties encountered in operation or construction)

References

This external links & data sheets go ...

Files

- Files for laser cutting, Excel sheets of suppliers etc..

Links

- External link : https://www.thingiverse.com/thing:2476523

Project Progress

Summary of how the project is going :

- Basic prototype done, development / drawings in progress ...
- Commenced cutting out of main components ...
- Ordered main hub & drive motor ...
- Order electrical parts ...

Log of works

- Drawn up a layout ... 2017.
- Make 1:5 scale Maquette ... 2017.
- Commence CNC cut-out ... 2017.
- Install camera / motor to track system ... 2017.
- Assemble turntable ... 2018.
- Layout system to enable testing ... 2018.
- Complete drive system ... Sept. 2018.

Project Table

Project	Percent Complete	Project Lead	Status	Budget Req	Budget Approved	Next Major Milestone	Subsequent Milestones to complete
Large Format Scanner	60%	Andrew	Approved	$500	$?	Complete Assembly	Begin testing & implementation of procedures for operation