

Materials List for:

Automated Rat Single-Pellet Reaching with 3-Dimensional Reconstruction of Paw and Digit Trajectories

Alexandra Bova¹, Krista Kernodle¹, Kaitlyn Mulligan¹, Daniel Leventhal^{2,3,4}

¹Neuroscience Graduate Program, University of Michigan

²Department of Neurology, University of Michigan

³Department of Biomedical Engineering, University of Michigan

⁴Department of Neurology, VA Ann Arbor Health System

Correspondence to: Daniel Leventhal at dleventh@med.umich.edu

URL: <https://www.jove.com/video/59979>

DOI: [doi:10.3791/59979](https://doi.org/10.3791/59979)

Materials

Name	Company	Catalog Number	Comments
clear polycarbonate panels	TAP Plastics		cut to order (see box design)
infrared source/detector	Med Associates	ENV-253SD	30" range
camera	Basler	acA2000-340kc	2046 x 1086 CMV2000 340 fps Color Camera Link
camera lens	Megapixel (computer)	M0814-MP2	2/3" 8mm f1.4 w/ locking Iris & Focus
camera cables	Basler	#2000031083	Cable PoCL Camera Link SDR/ MDR Full, 5 m - Data Cables
mirrors	Amazon		
linear actuator	Concentrics	LACT6P	Linear Actuator 6" Stroke (nominal), 110 Lb Force, 12 VDC, with Potentiometer
pellet reservoir/funnel	Amico (Amazon)	a12073000ux0890	6" funnel
guide tube	ePlastics	ACREXT.500X.250	1/2" OD x 1/4" ID Clear. Extruded Plexiglass Acrylic Tube x 6ft long
pellet delivery rod	ePlastics	ACRCAR.250	0.250" DIA. Cast Acrylic Rod (2' length)
plastic T connector	United States Plastic Corp	#62065	3/8" x 3/8" x 3/8" Hose ID Black HDPE Tee
LED lights	Lighting EVER	4100066-DW-F	12V Flexible Waterproof LED Light Strip, LED Tape, Daylight White, Super Bright 300 Units 5050 LEDS, 16.4Ft 5 M Spool
Light backing	ePlastics	ACTLNAT0.125X12X36	0.125" x 12" x 36" Natural Acetal Sheet
Light diffuser films	inventables	23114-01	.007x8.5x11", matte two sides
cabinet and custom frame materials	various (Home Depot, etc.)		3/4" fiber board (see protocol for dimensions of each structure)
acoustic foam	Acoustic First		FireFlex Wedge Acoustical Foam (2" Thick)
ventilation fans	Cooler Master (Amazon)	B002R9RBO0	Rifle Bearing 80mm Silent Cooling Fan for Computer Cases and CPU Coolers
cabinet door hinges	Everbilt (Home Depot)	#14609	continuous steel hinge (1.4" x 48")
cabinet wheels	Everbilt (Home Depot)	#49509	Soft rubber swivel plate caster with 90 lb. load rating and side brake
cabinet door handle	Everbilt (Home Depot)	#15094	White light duty door pull (4.5")

computer	Hewlett Packard	Z620	HP Z620 Desktop Workstation
Camera Link Frame Grabber	National Instruments	#781585-01	PCIe-1473 Virtex-5 LX50 Camera Link - Full
Multifunction RIO Board	National Instruments	#781100-01	PCIe-17841R
Analog RIO Board Cable	National Instruments	SCH68M-68F-RMIO	Multifunction Cable
Digital RIO Board Cable	National Instruments	#191667-01	SHC68-68-RDIO Digital Cable for R Series
Analog Terminal Block	National Instruments	#782536-01	SCB-68A Noise Rejecting, Shielded I/O Connector Block
Digital Terminal Block	National Instruments	#782536-01	SCB-68A Noise Rejecting, Shielded I/O Connector Block
24 position relay rack	Measurement Computing Corp.	SSR-RACK24	Solid state relay backplane (Gordos/OPTO-22 type relays), 24-channel
DC switch	Measurement Computing Corp.	SSR-ODC-05	Solid state relay module, single, DC switch, 3 to 60 VDC @ 3.5 A
DC Sense	Measurement Computing Corp.	SSR-IDC-05	solid state relay module, single, DC sense, 3 to 32 VDC
DC Power Supply	BK Precision	1671A	Triple-Output 30V, 5A Digital Display DC Power Supply
sugar pellets	Bio Serv	F0023	Dustless Precision Pellets, 45 mg, Sucrose (Unflavored)
LabVIEW	National Instruments	LabVIEW 2014 SP1, 64 and 32-bit versions	64-bit LabVIEW is required to access enough memory to stream videos, but FPGA coding must be performed in 32-bit LabVIEW
MATLAB	Mathworks	Matlab R2019a	box calibration and trajectory reconstruction software is written in Matlab and requires the Computer Vision toolbox