Bill of materials

Item	Total price ($)	Remarks
LEGO bricks	~60	I recommend buying extra bricks in different sizes.
Raspberry Pi	10-50	Any model works.
Raspberry Pi camera	25	
Camera flex cable	3	A long cable (>40cm) is preferred if the Raspberry Pi cannot be placed closer to the camera.
Magnifying lens	10	M12 thread
Micro SD card	10	Raspberry Pi operating system. Minimum 16GB is recommended.
HDMI display	50-150	Optional if an HDMI display is already available. The price varies depending on the size and the model.
Arduino board x2	20	One for the mainboard, one for the controller. Any Arduino board with enough number of IO pins should work.
Stepper motor driver x6	30	Any other 5V compatible driver should work. Microstepping was not needed in this project.
Stepper motor x6	15	28BYJ-48, 5V, 1/64 gear ratio
JST-XH 5P 4S cables	7	A few of these cables are required the extend the default cable of the stepper motor (28BYJ-48)
High-power LED	4	
High-power LED driver	14	
Light diffuser	3	An LED backlight module is modified by replacing the low-power LED by a high-power one
Potentiometer	1	LED intensity control using pulse-width modulation.
Thumb joysticks x3	12	Three joysticks for X, Y, Z, Camera, Tilt, and Rotation.
5V power supply	20	At least 3A is preferred. A more powerful supply may be needed if the display is also powered from the same supply.
DC-DC converter	3	In case the LED and its driver require more than 5V.
OLED display	3	Displays the LED intensity or any other information on the controller.
USB connector (type A)	0.5	Connection between the mainboard and the controller (mainboard side).
USB connector (micro)	0.5	Connection between the mainboard and the controller (controller side).
JST XH connector set	5	Connectors for the stepper motors and the LED
DC barrel connector	1	In case a separate DC input (e.g. 12V) is needed for the LED
OVERALL TOTAL	~300	

- The prices and the links are for exemplary components that were used in this prototype.
- Any other compatible model should work in principle.
- The total price varies significantly depending on the vendor and the model. For example, the type of the Raspberry Pi and the display makes a big difference in the price.
- The cost of 3D-printed parts is not included.
- There are also a few other accessories needed, like USB cables, an HDMI cable, optionally a mouse and a keyboard, an ON/OFF switch, screws and nuts, and printed circuit boards (PCBs).

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