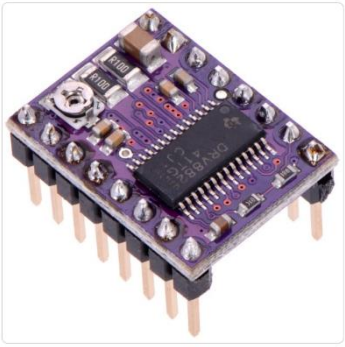
Stepper Motor Driver Boards

Motor Driver	Description	Cost	Picture	Reference
A4988 Stepper Motor Driver	-Comes with heatsink -3.3 and 5 V compatible logic supply -Five micro step resolutions (down to 1/16-step)	$1.08		1
DRV8825 Stepper Motor Driver (Header Pins Soldered)	-Breakout board for DRV8825 stepper motor -Six micro step resolutions (down to 1/32-step) -Continuous current per phase: 1.5A -Comes with 0.1"-pitch male header pins installed -Comes with heatsink -5 V compatible logic supply	$9.39		2
TB6600 Stepper Motor Driver	-For two-phase stepper motors -Arduino compatible -Able to output a 4A peak current -8 kinds of current control from 0.5A to 3.5A and 7 kinds of micro steps -Power input from 9 to 42VDC -Contains optical isolator. -Does need bread board	$17.99		3
MakeBlock MegaPi Stepper Motor Driver	-Motor driver: DRV8825 -Output current： 1.75A (with proper heatsinking at 24 V and 25°C） -Max current: 2.5A (pay attention to heat dissipation) -Drive voltage: 8.2V-45V -Note: MegaPi max supply voltage 12V -Logic voltage: 5V -Comes with heat sink -Six micro step resolutions (down to 1/32-step).	$9.99		4

Summary of Motor Drivers

Overall the motor drivers 1,2 and 4 would work well as all are of the same size and set up. However, motor driver 3 is too large of a component to be able to be used in our design and so can be disregarded.

Motor driver 1 is cheap and a video has been found in which it is shown driving a stepper motor of a similar size to the ones that will be used in this design. This suggests reliability and that the driver will perform as expected.

Motor drivers 2 and 4 have essentially the same performance and cost almost the same. I have found more confident reviews from motor driver 2 however and so I think that is the better option from these two motors

Therefore, either motor driver 1 or 2 would be the best choice for this project and as motor driver 1 is the cheaper of the two it is the motor driver that should be used in this project.

References (links):

1)

https://www.aliexpress.com/item/1pcs-3D-Printer-Kit-A4988-Stepper-Motor-Driver-Module-with-Heatsinks-Reprap-Board-For-3D-Printer/32619839273.html?src=google&albslr=202380396&src=google&albch=shopping&acnt=494-037-6276&isdl=y&slnk=&plac=&mtctp=&albbt=Google_7_shopping&aff_platform=google&aff_short_key=UneMJZVf&&albcp=1622677378&albag=57224001810&trgt=296904914040&crea=en32619839273&netw=u&device=c&gclid=Cj0KCQiAxNnfBRDwARIsAJlH29DtR9-8fDSm824xgc8-GOw36qcOiCk2S-6pQwTaGcJx8YD-0dFytKAaAhmmEALw_wcB&gclsrc=aw.ds

video involving driver:

https://www.youtube.com/watch?v=fHAO7SW-SZI

2)

https://www.banggood.com/5Pcs-3D-Printer-Stepstick-DRV8825-Stepper-Driver-Reprap-4-Layer-PCB-p-968935.html?rmmds=detail-bottom-viewalsoview__5&cur_warehouse=CN

3)

https://www.robotshop.com/en/tb6600-stepper-motor-driver.html

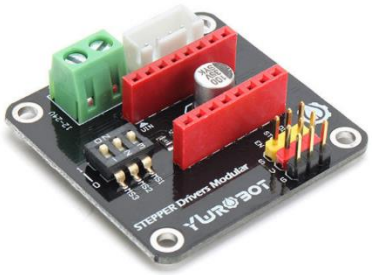
4)

https://www.robotshop.com/en/makeblock-megapi-stepper-motor-driver.html

Selecting a board for the Motor Driver

3D Printer 42 Stepper Motor Drive Expansion Board 8825 / A4988:

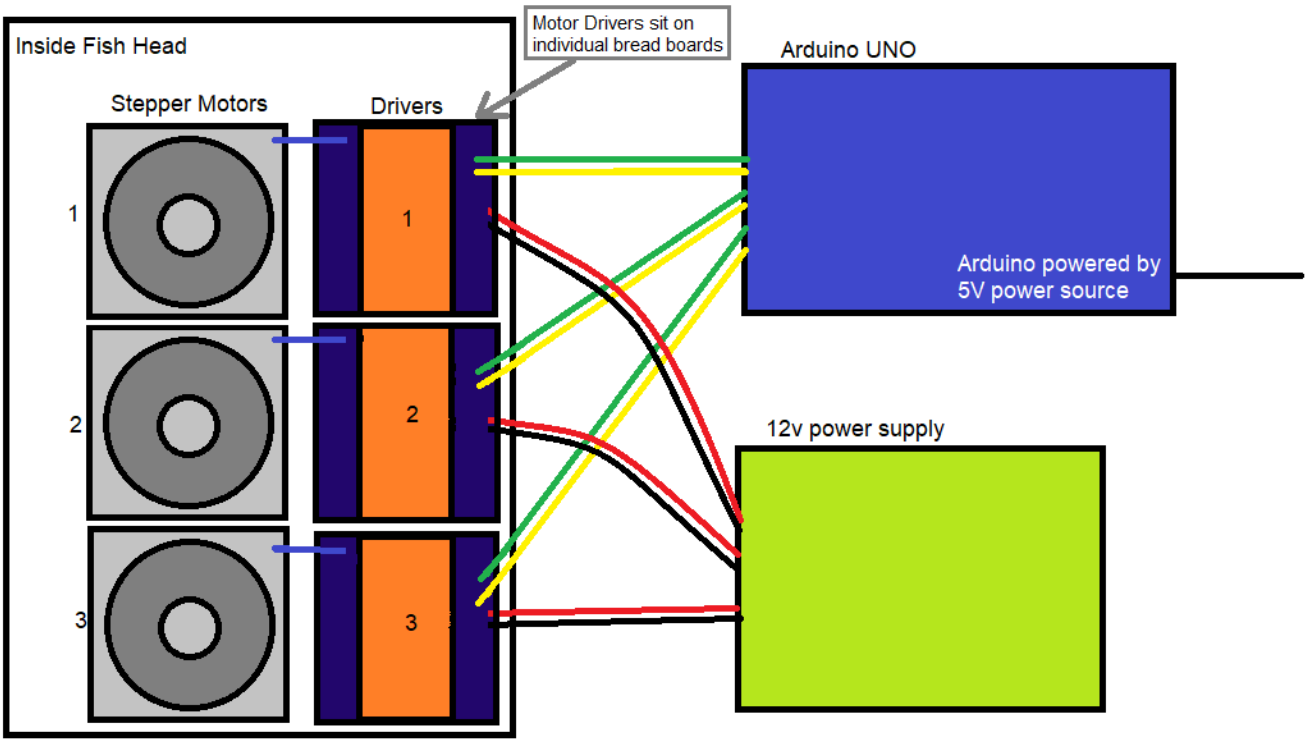
-This would work well for one stepper motor and may be useful to use one for each stepper motor if there is limited space as will allow for a more compact design.
-Costs £3.12 each (3 needed) and motor drivers not included.
-Simplistic design and having a separate board for each stepper will mean less likelihood of mistakes in coding of Arduino and assembly.



Link:

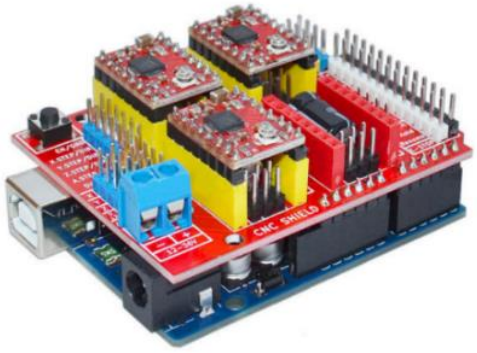
https://www.banggood.com/3D-Printer-42-Stepper-Motor-Drive-Expansion-Board-8825-A4988-p-1028319.html?cur_warehouse=CN

This design would be good for a circuit with the Arduino **outside** of the fish head as the individual driver boards will be able to be arranged in to a more compact design.
E.g.



Geekcreit® UNO R3 with 4pcs A4988 Driver with CNC Shield V3 Expansion Board for Arduino 3D Printer:

-Includes:
1 x 3D Printer Expansion Board
1 x UNO R3 board with USB
4 x A4988 driver
-Comes with 4 stepper motor drivers very similar to stepper motor driver 1. This means we will have a spare driver if one fails and it may work out cheaper due to the reduced number of wires and the included Arduino.
-It is designed so that the board sits directly on top of the Arduino that comes with purchase. This will make the assembling of the electronics easier.
-The cost is £12.63.



Link:

https://www.banggood.com/Geekcreit-UNO-R3-With-4pcs-A4988-Driver-With-CNC-Shield-V3-Expansion-Board-For-Arduino-3D-Printer-p-967060.html?gmcCountry=GB&currency=GBP&createTmp=1&utm_source=googleshopping&utm_medium=cpc_elc&utm_content=zouzou&utm_campaign=pla-uk-ele-pc&gclid=Cj0KCQiAxNnfBRDwARIsAJlH29CAqHLV9sLrmK5K6X11kvfUPNfBdWvgSFVXwYxXfq4TrIgVK_g1V6EaAuv6EALw_wcB&cur_warehouse=CN

This design would be good for a circuit with the Arduino **inside** of the fish head as the fish head will have to house the Arduino anyway. E.g.