

Measuring the eigenfrequencies of candlestick stalagmites with a custom 3D-printed sensor modified from a Raspberry Shake 3D

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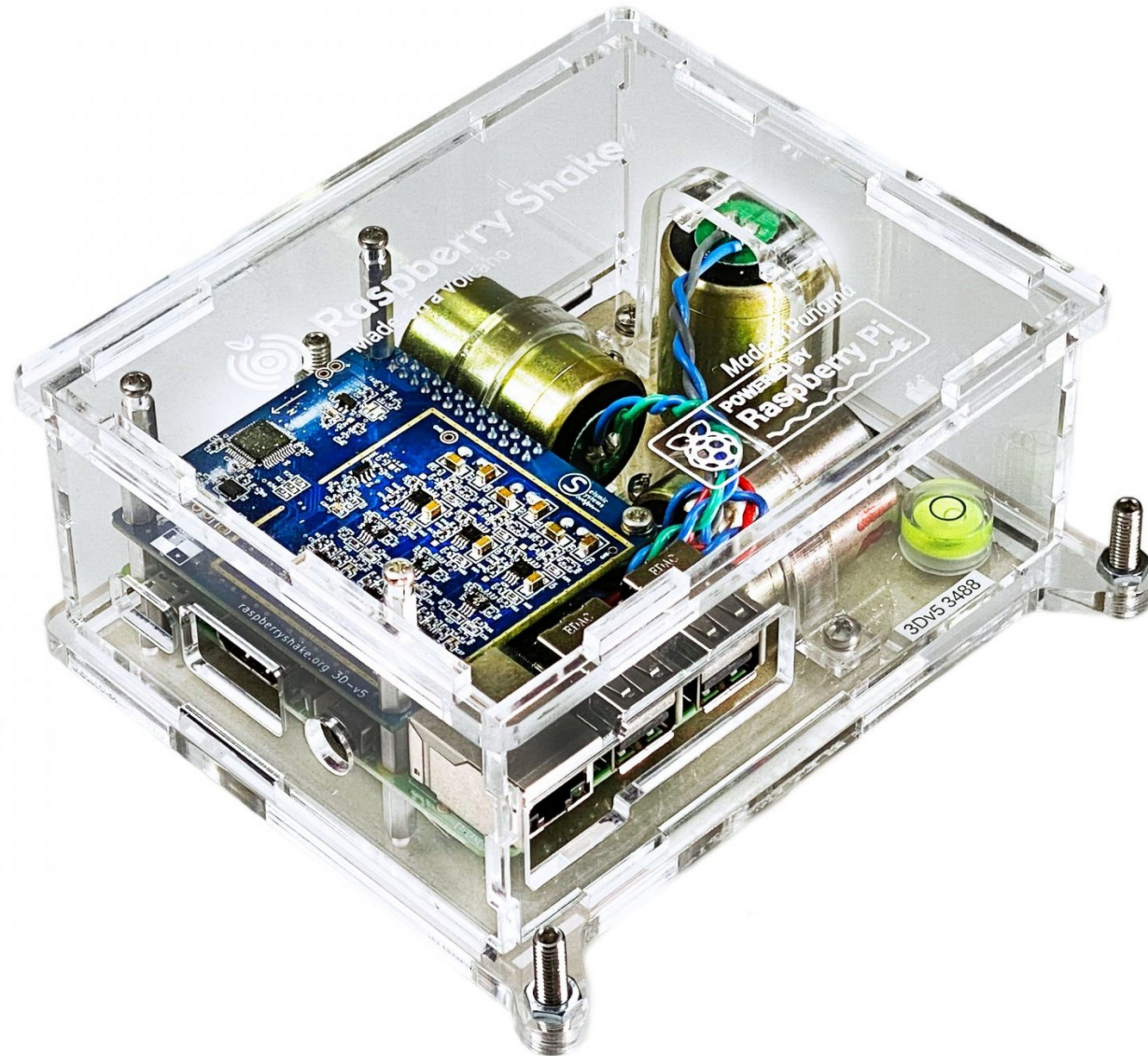


**IMPORTANT
IN THE FRAME OF
SEISMIC HAZARD
STUDIES**

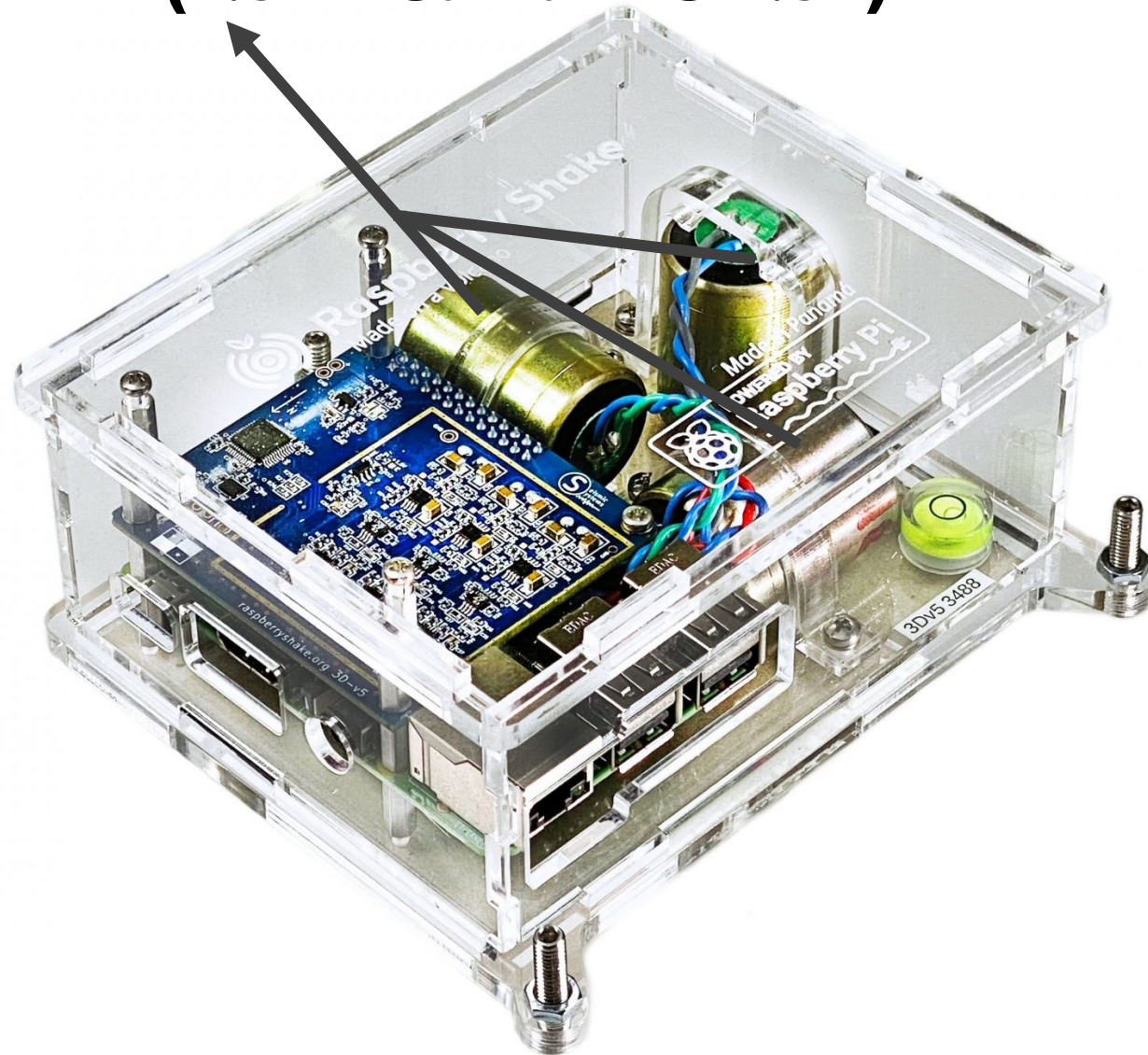


This presentation participates in OSPP

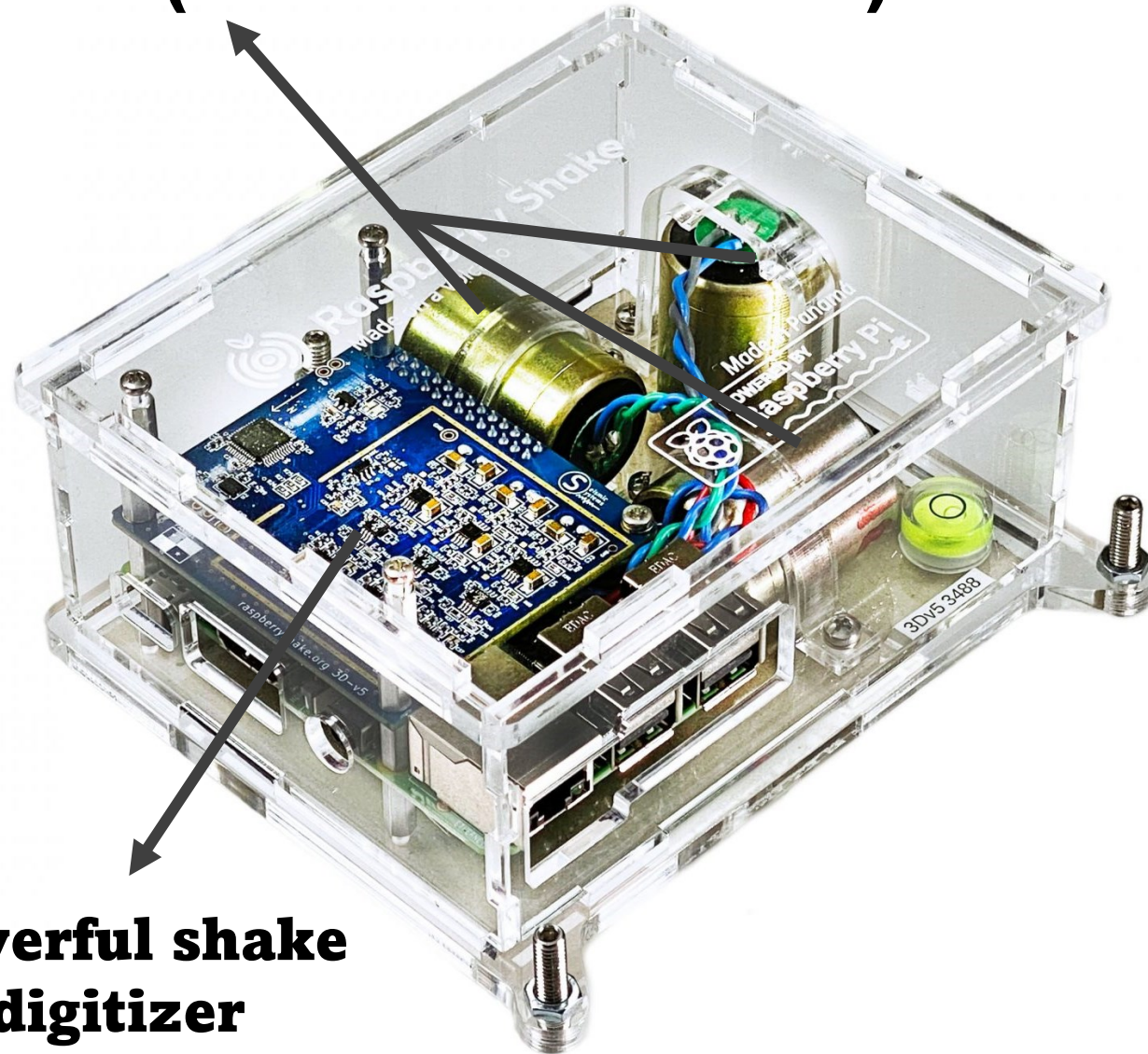
Raspberry Shake 3D



Three orthogonal weak motion geophones (4.5 Hz Sunfull PS-4.5B)

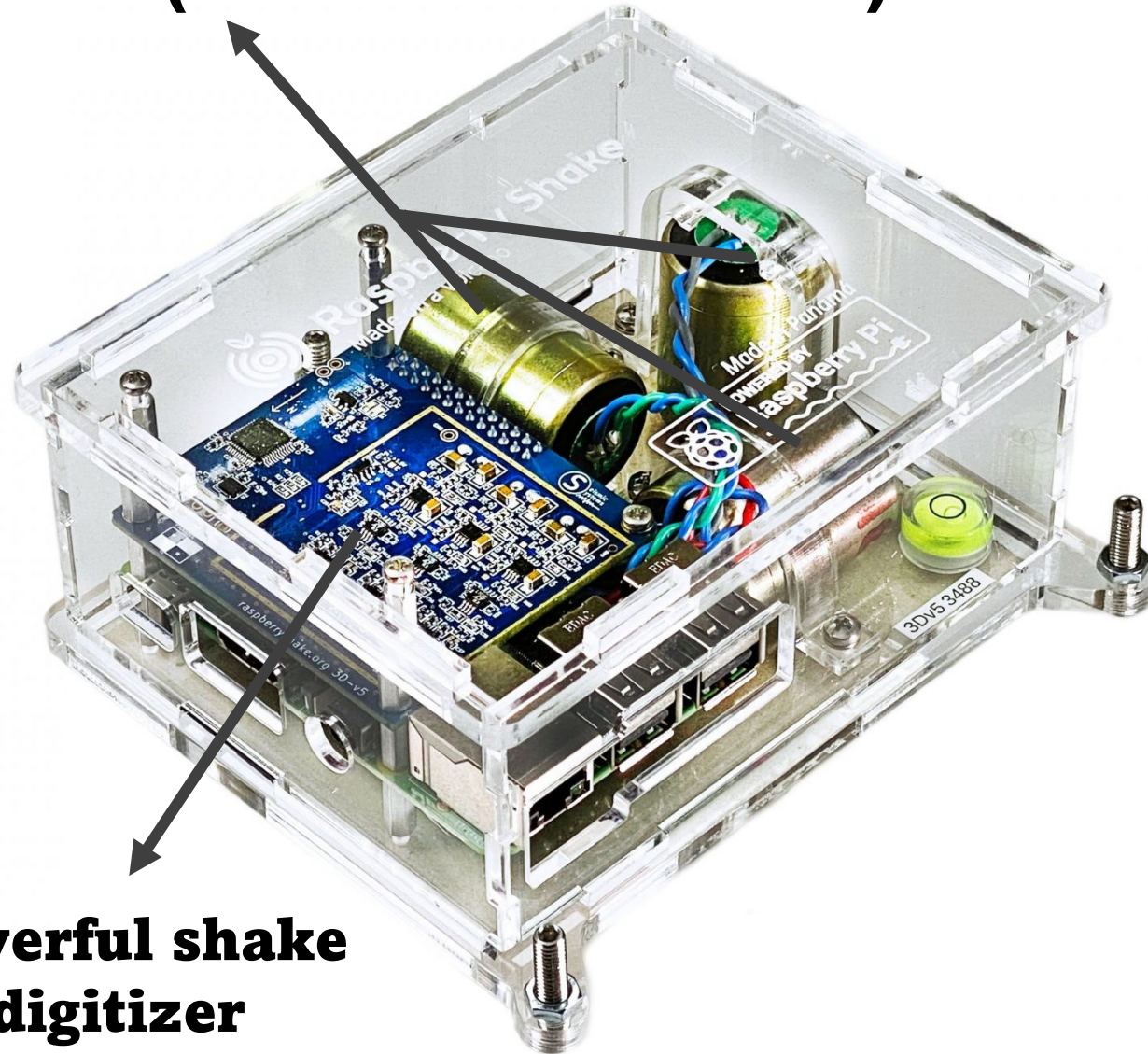


**Three orthogonal weak motion geophones
(4.5 Hz Sunfull PS-4.5B)**



**Powerful shake
digitizer
and Raspberry pi
computer**

Three orthogonal weak motion geophones (4.5 Hz Sunfull PS-4.5B)



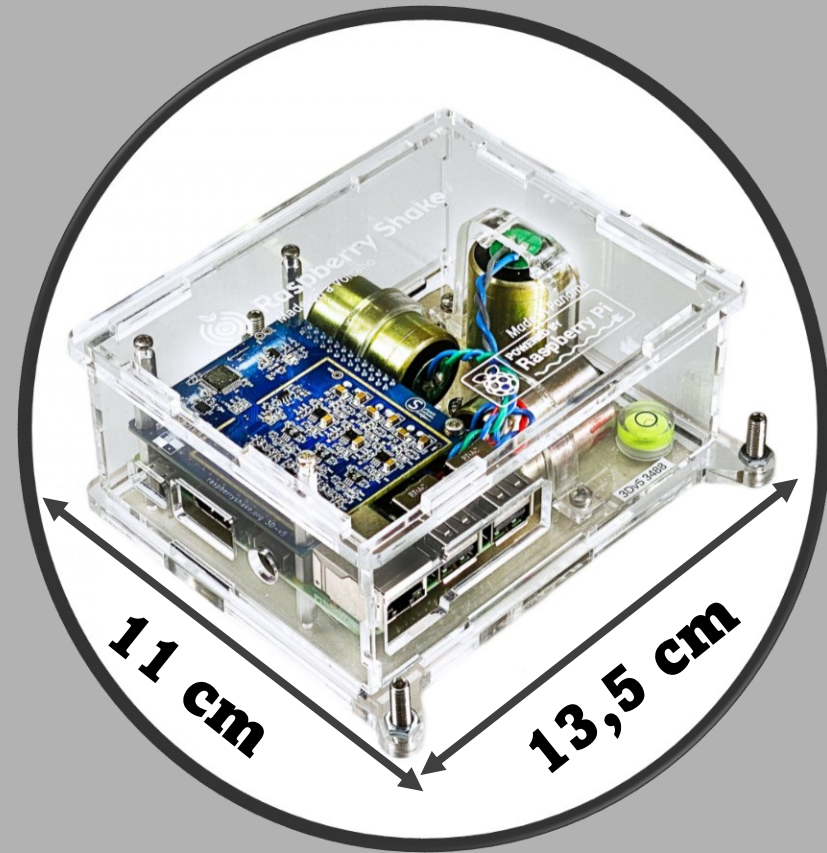
**Powerful shake
digitizer
and Raspberry pi
computer**

**Many
scientific
uses**

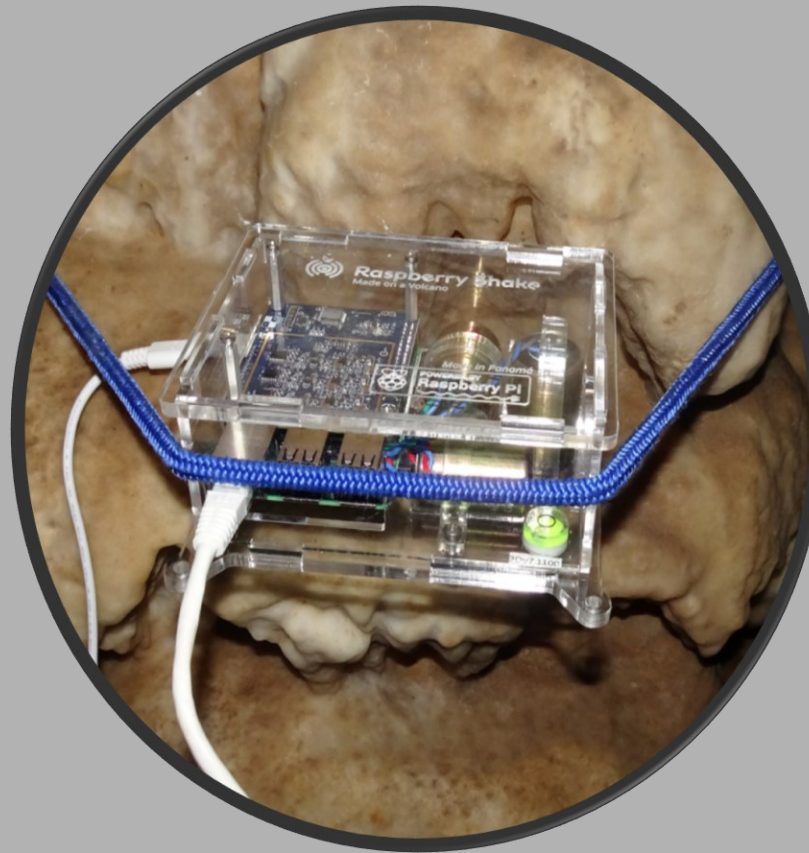
Measurement of the eigenfrequencies of candlestick stalagmites



Challenges in attaching the sensor on the stalagmites



Shape

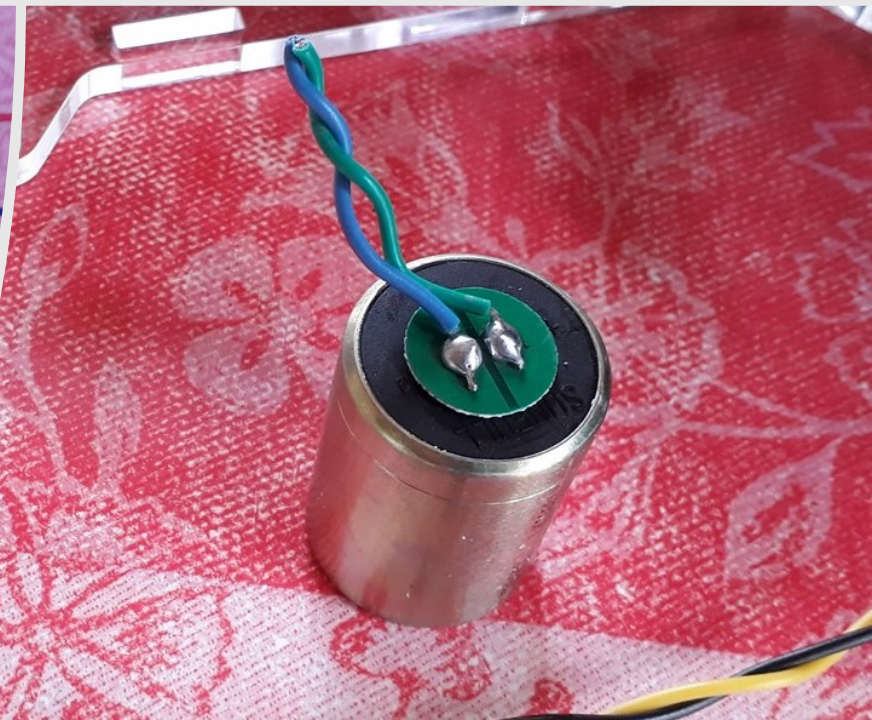
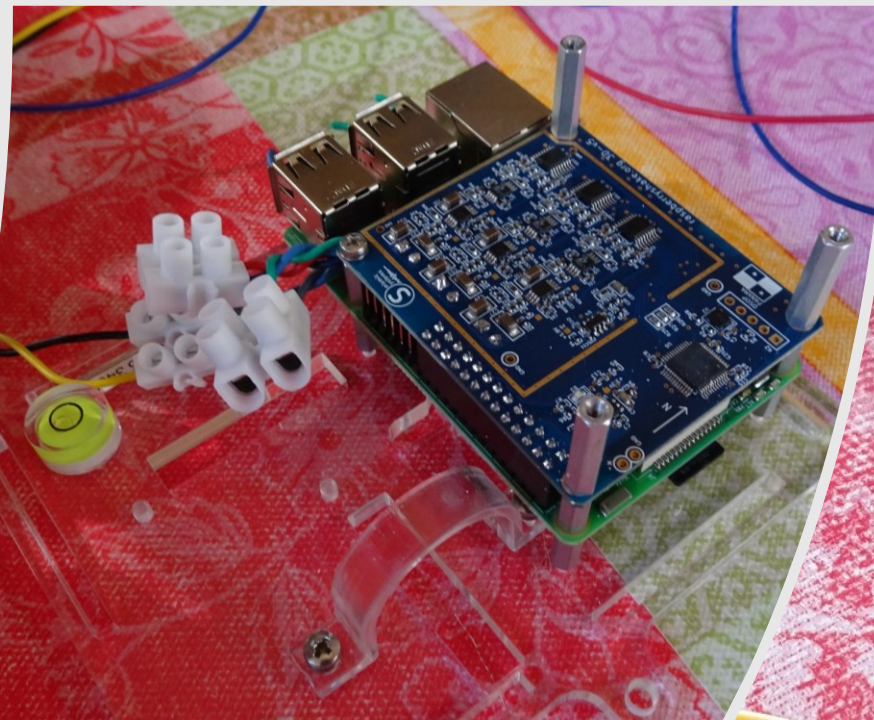
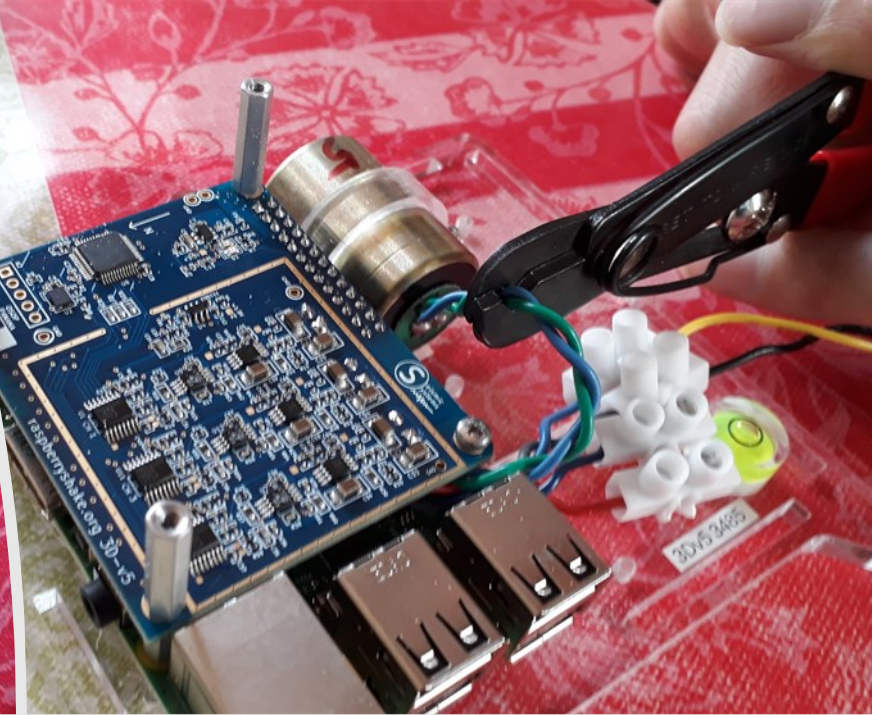
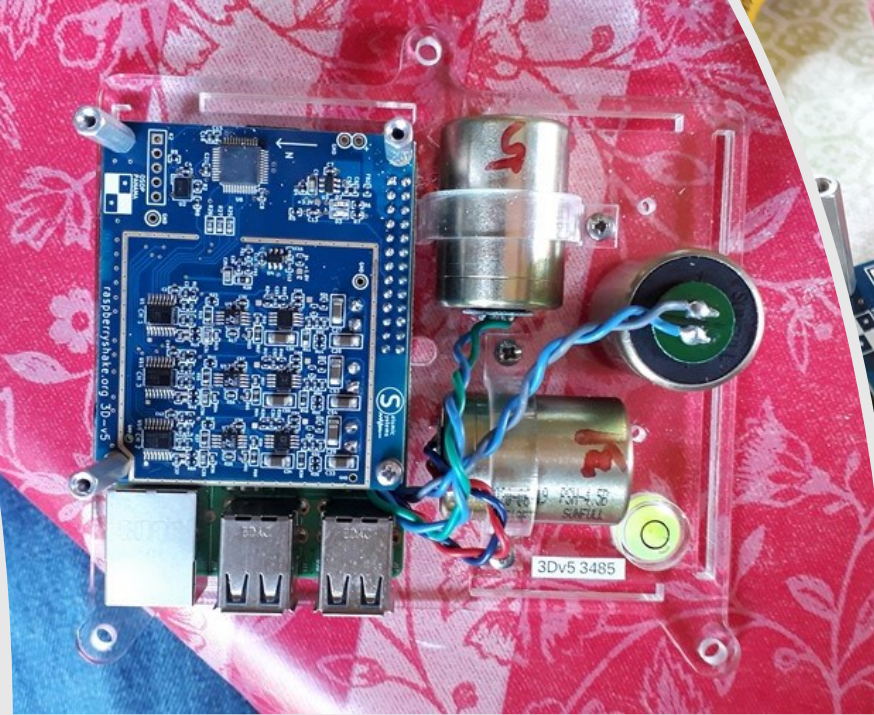


Position

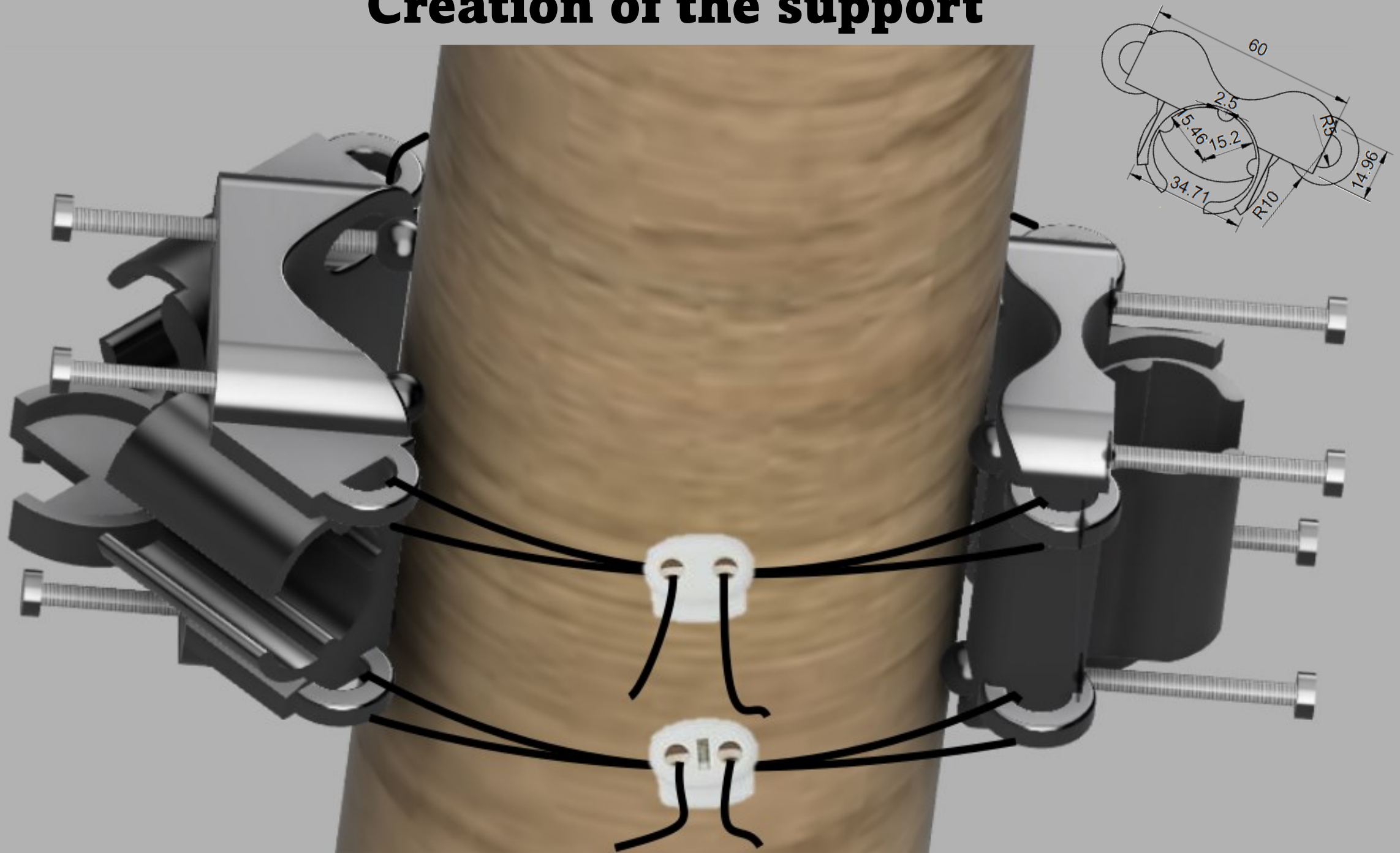


Weight

Separation of seismic sensors from the acquisition system

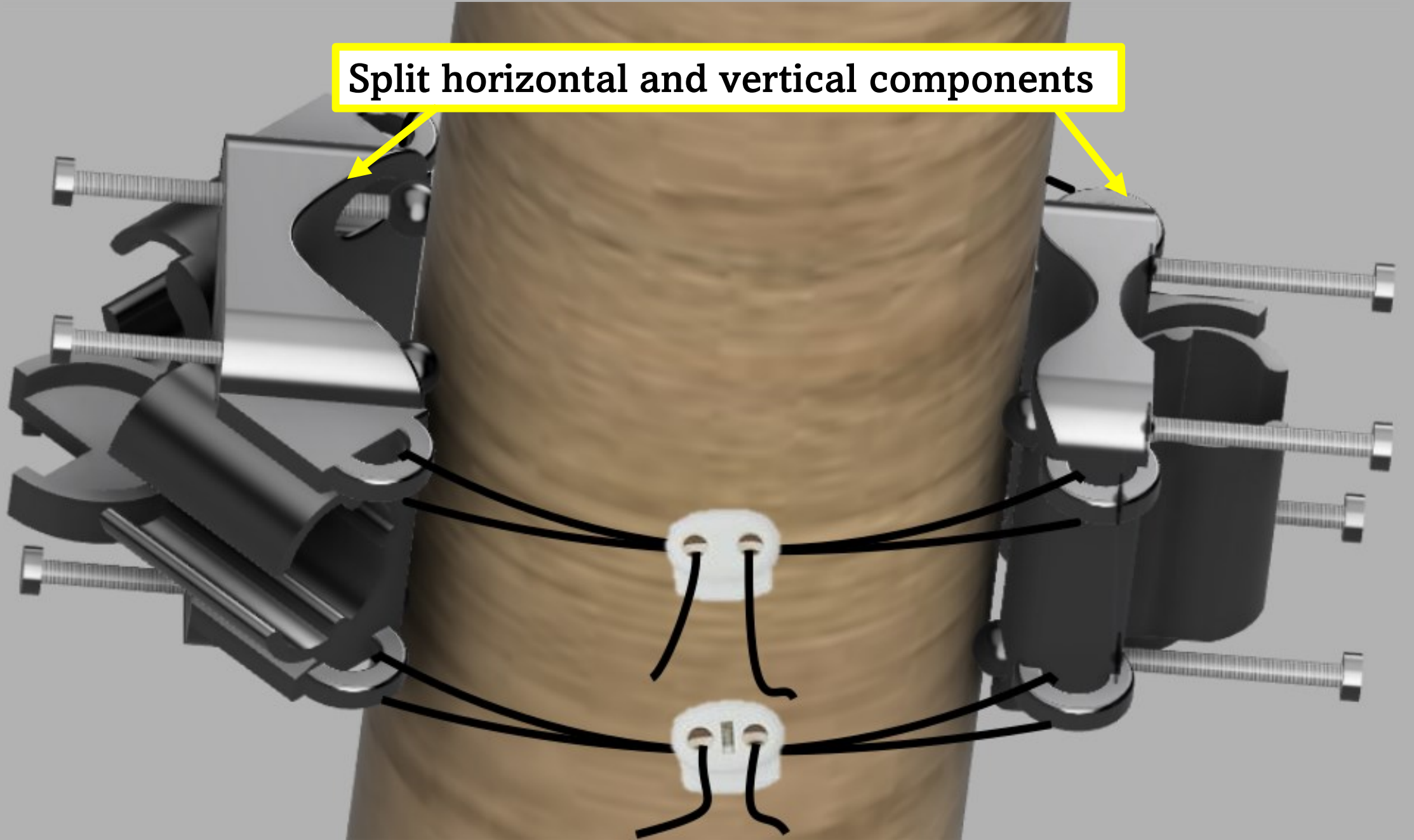


Creation of the support



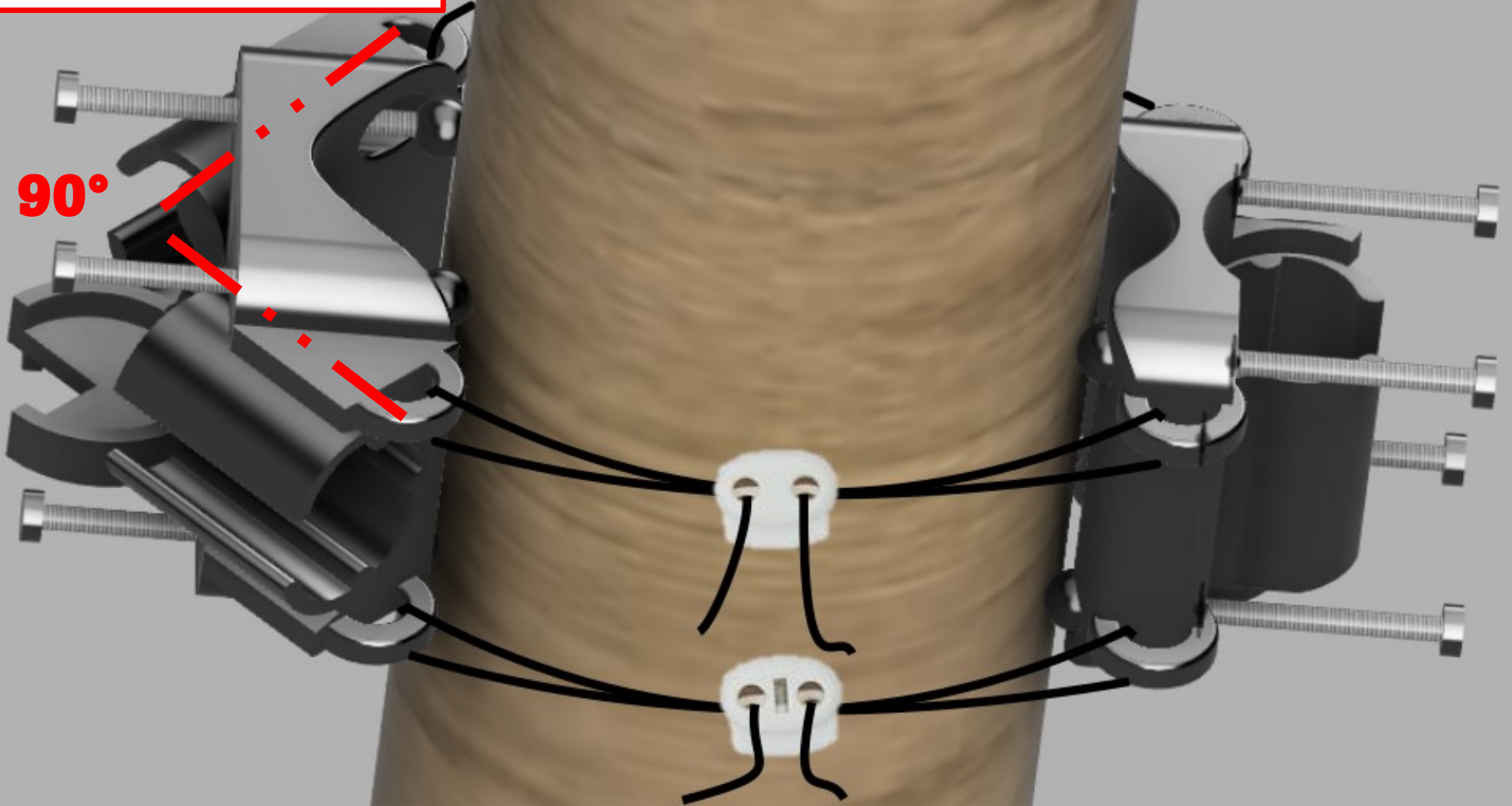
Creation of the support

Split horizontal and vertical components

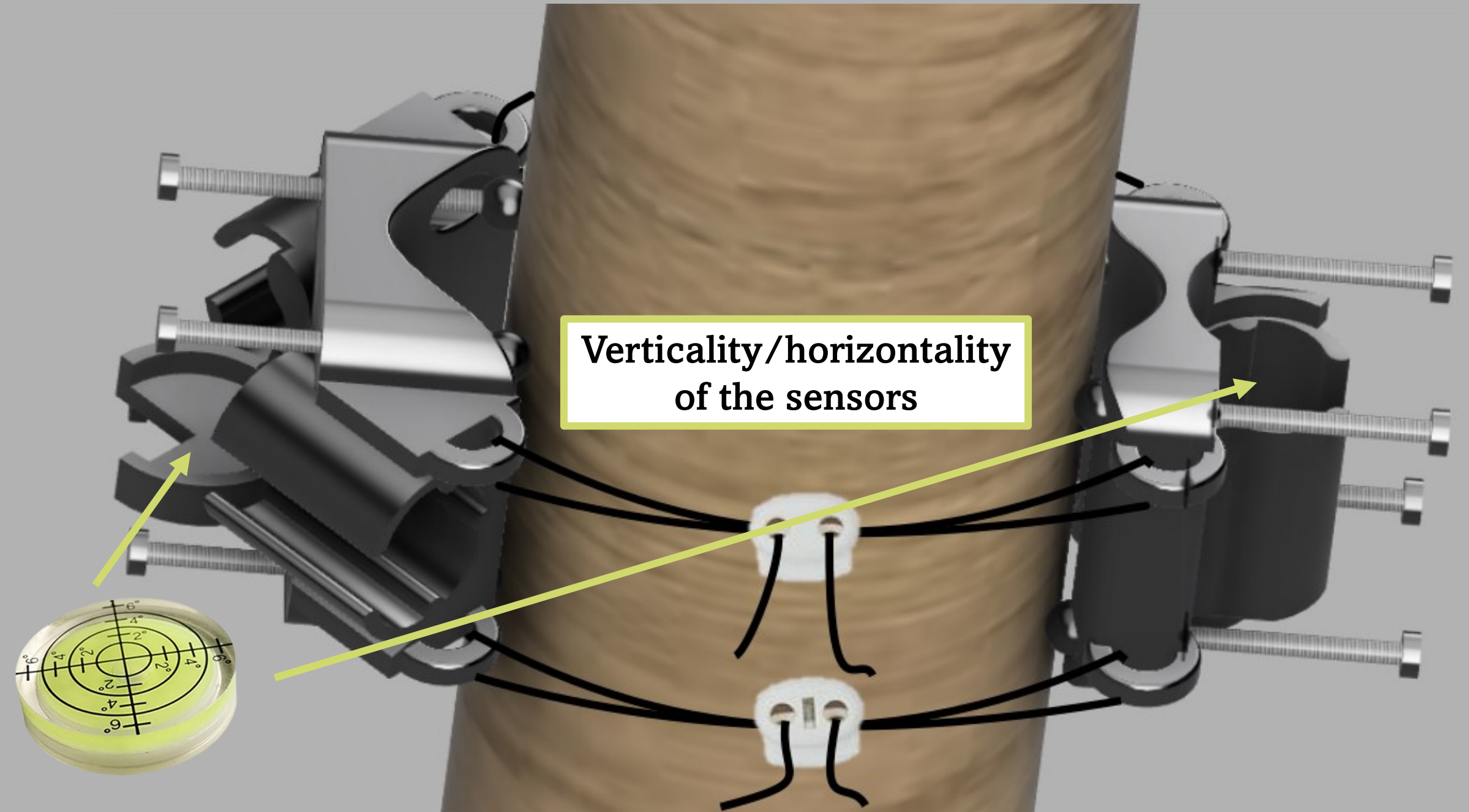


Creation of the support

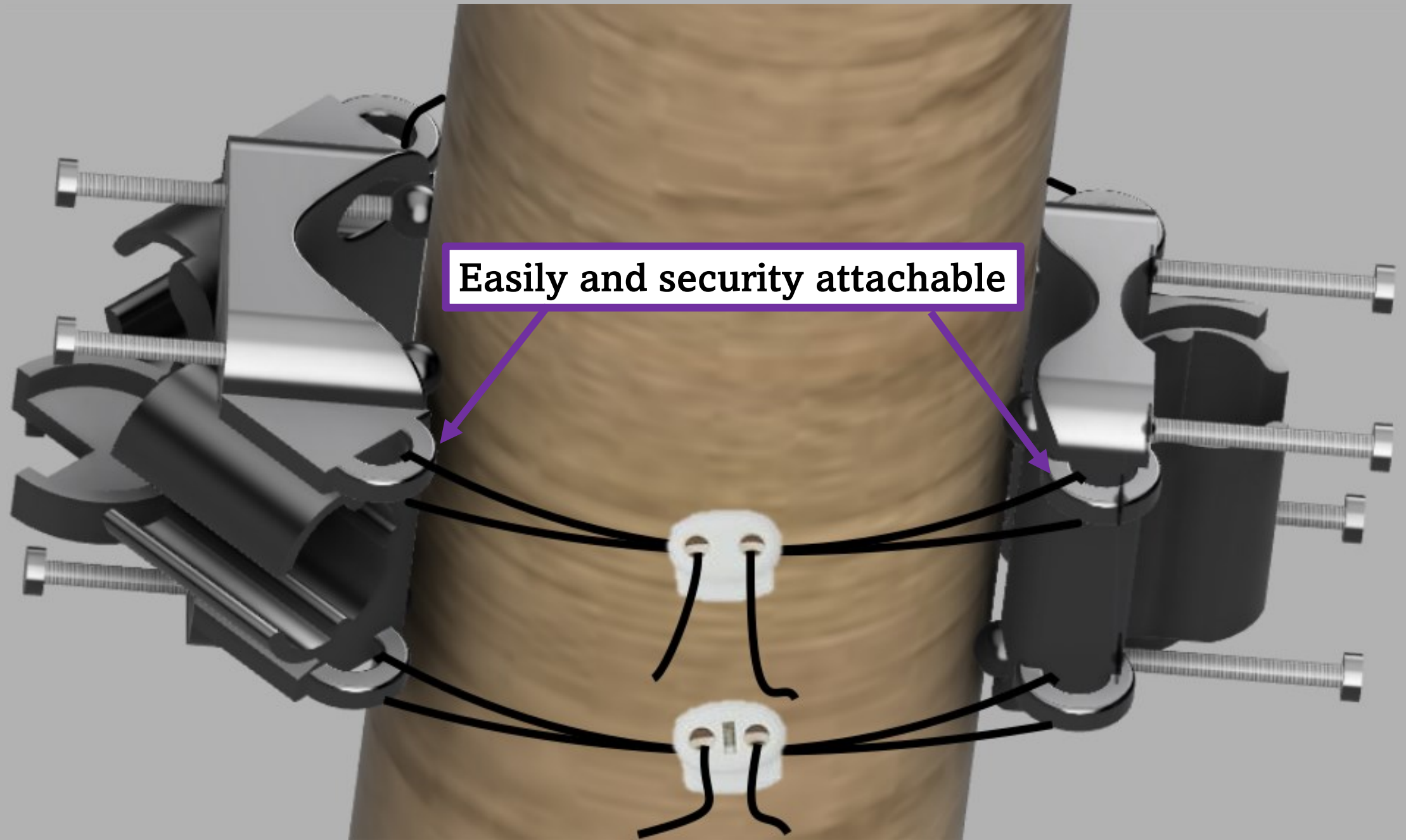
Perpendicularity between
horizontal sensors



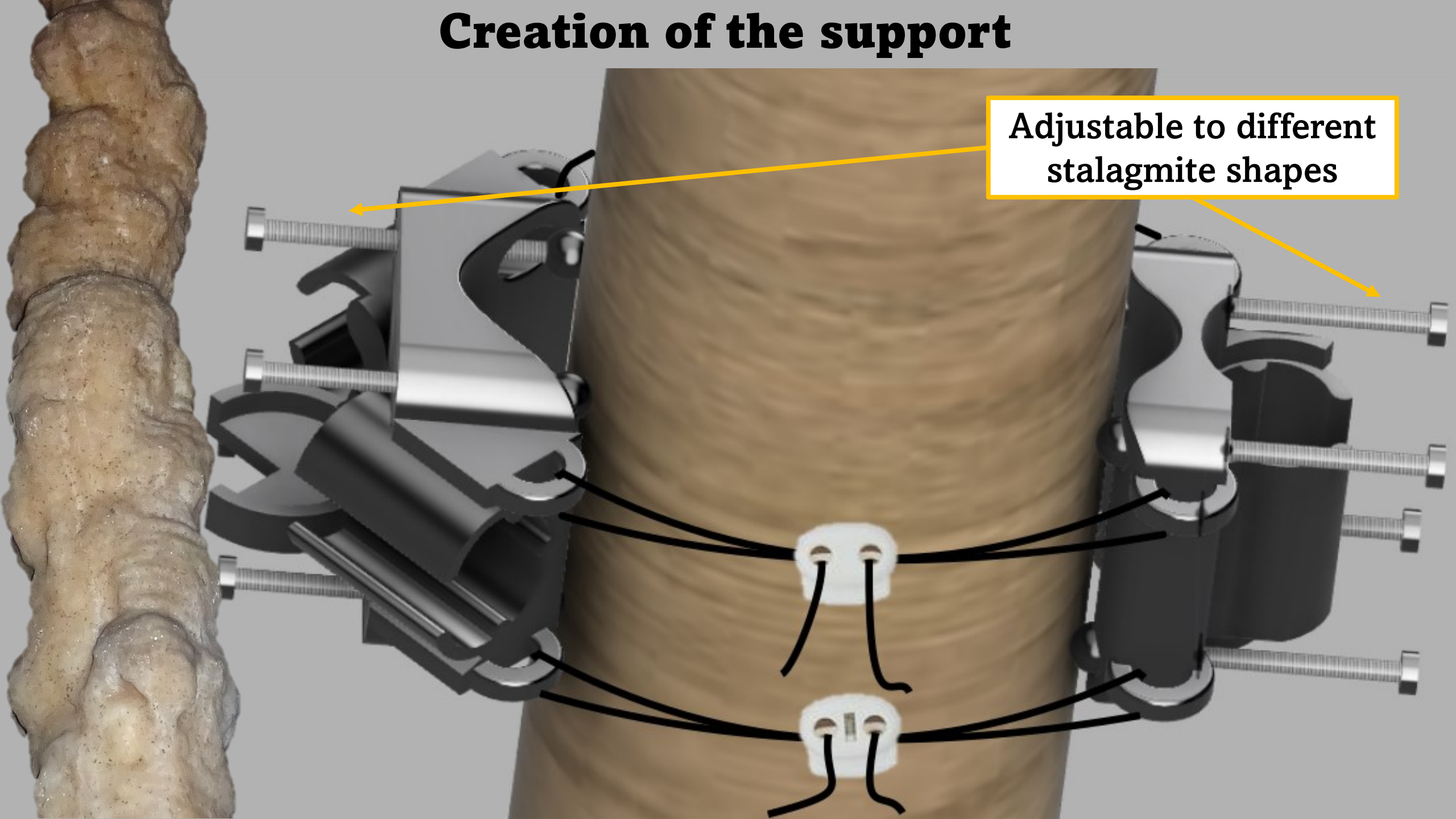
Creation of the support



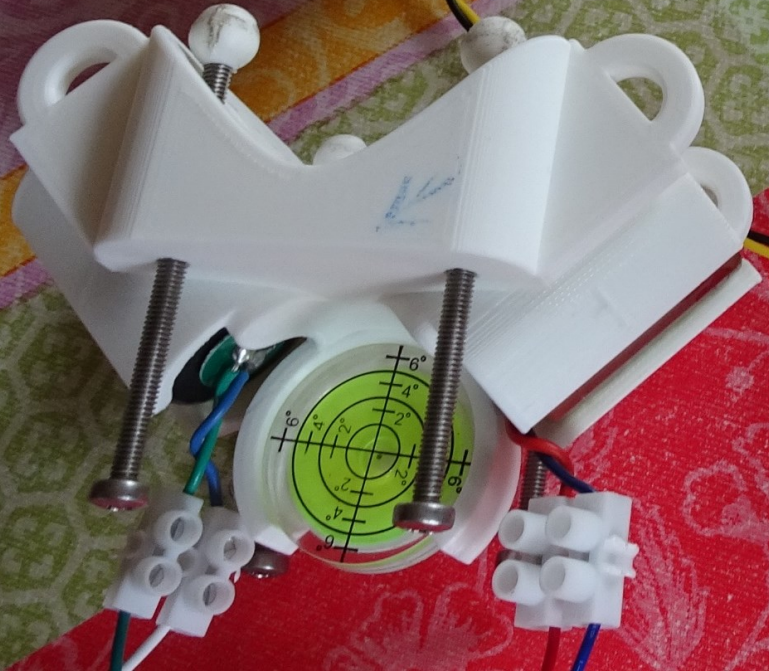
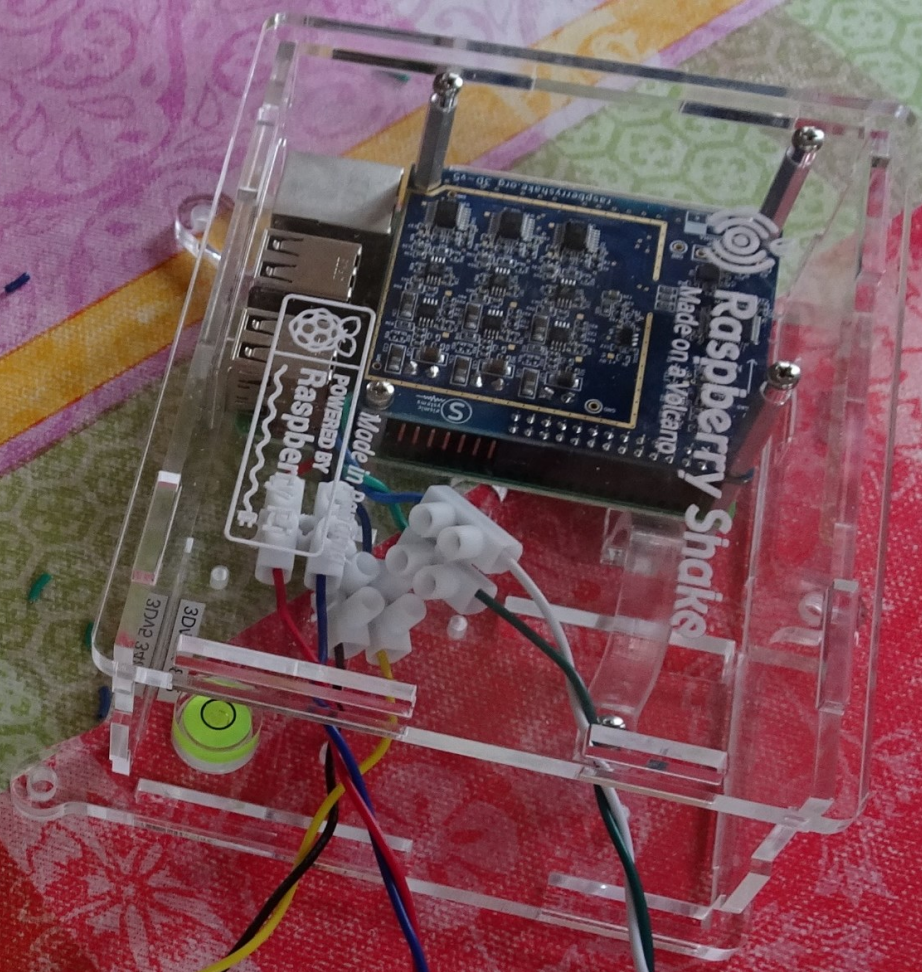
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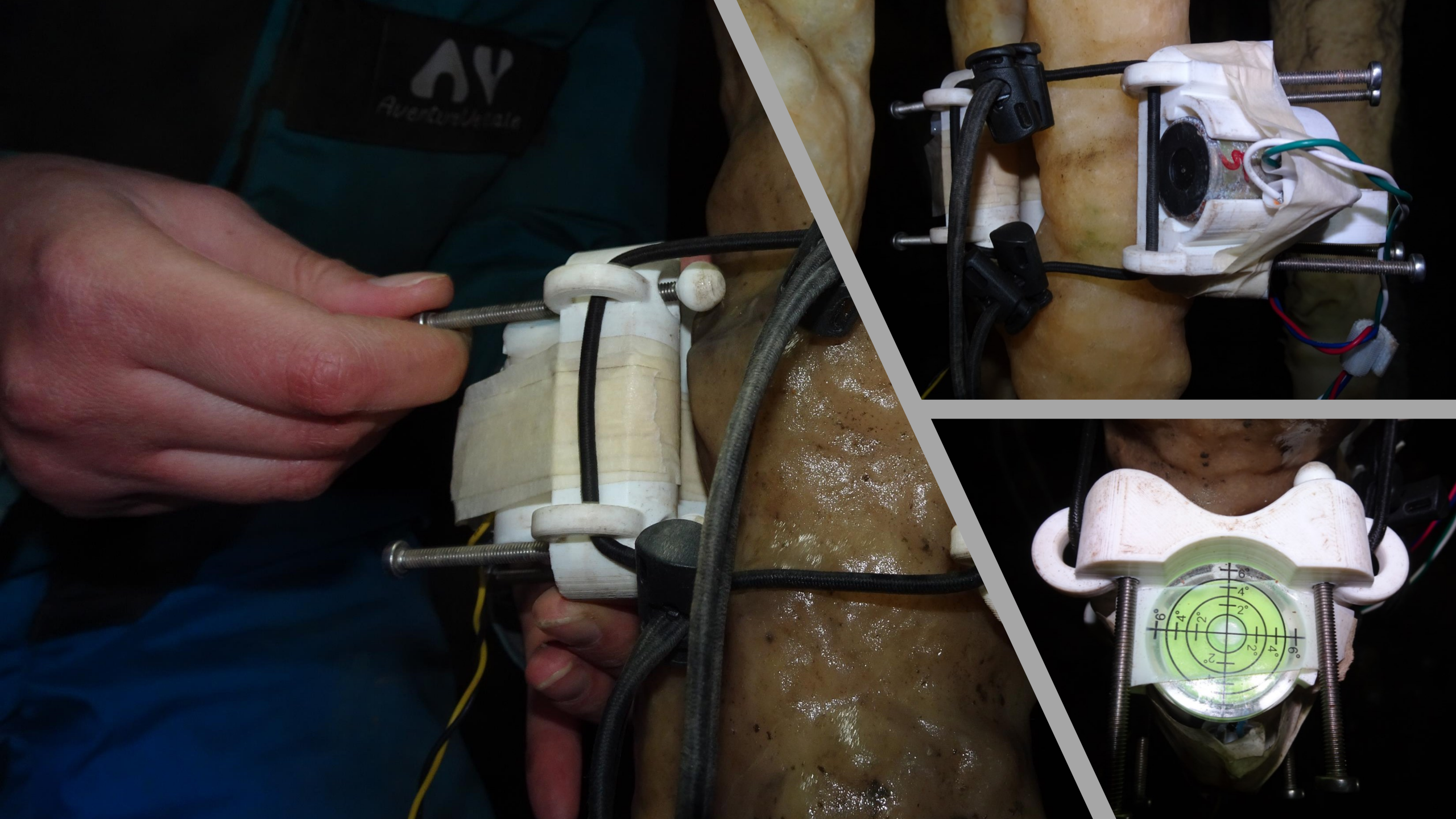


Creation of the support



Adjustable to different stalagmite shapes





Eigenfrequencies

Stalagmite	Frequency
ST25	5,6 Hz
ST36	7,1 Hz
Minaret	12,2 and 15,1 Hz
ST12b	12,6 and 15,9 Hz
ST10	14,1 Hz
ST2	14,2 Hz
ST29	15,9 Hz
St6	16,2 Hz
ST4	17,5 Hz
ST1	18,1 Hz
ST23	19,8 Hz
ST34	20,4 Hz
ST5	28,1 Hz



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