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# Progress in soft and bio-inspired actuation systems

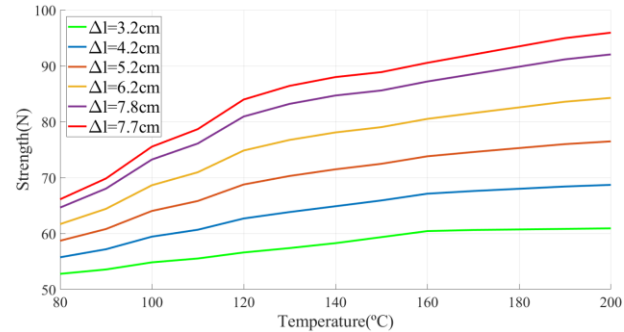
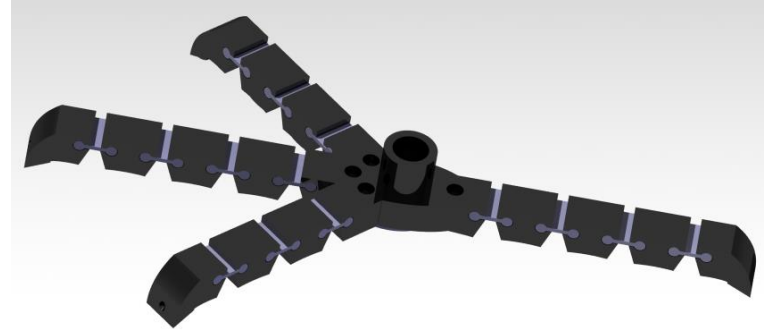
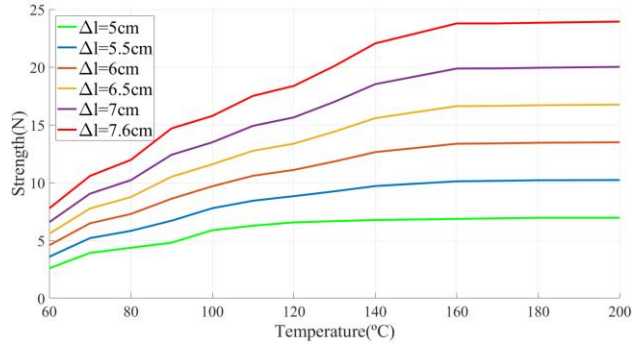
Alejandro E. Gómez Tamm  
Vicente Pérez Sánchez  
Begoña C. Arrue  
Aníbal Ollero



# Bio-Inspired Claw



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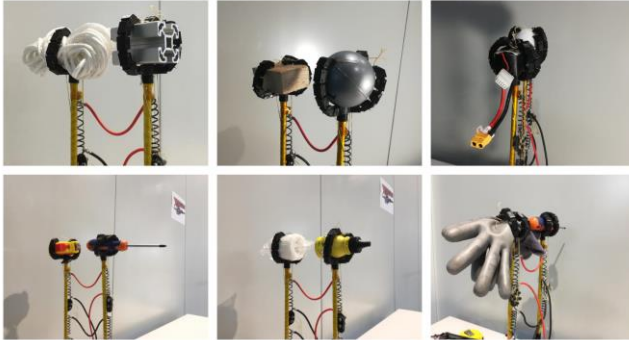


$$\delta_{effective} = \delta_M + \delta_L - \delta_H$$

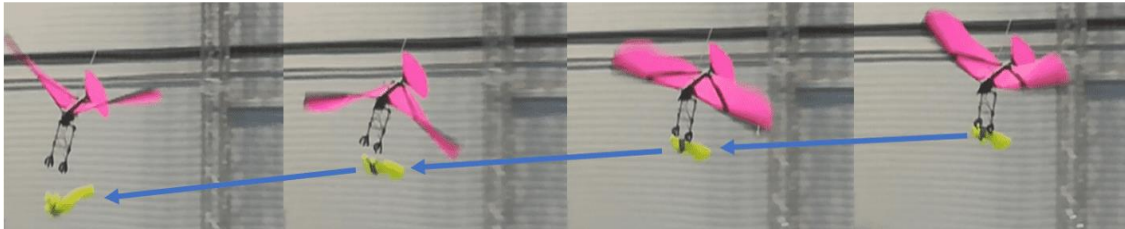
$$\delta = \frac{8FD^3n}{Gd^4}$$

$$\delta_M = \frac{\pi\gamma D^2n}{d\kappa}$$

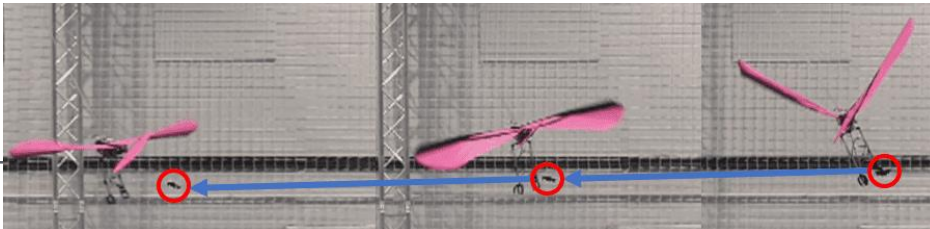
Accepted in IROS2020



Grasping Different Objects



Object Delivery



Mini-Drone Delivery



# Video



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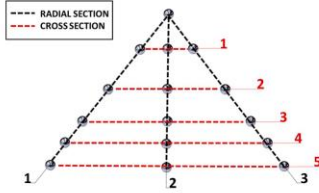
**SMA actuated low-weight bio-inspired claws for grasping and perching using flapping wing aerial systems**

A. E. Gomez Tamm, V. Perez-Sanchez, B.C. Arrue and A. Ollero

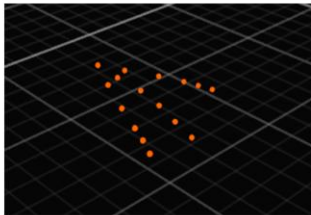




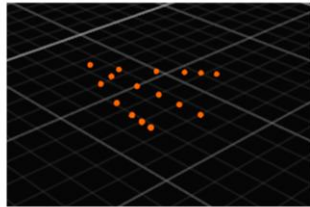
(a) Markers arrangement



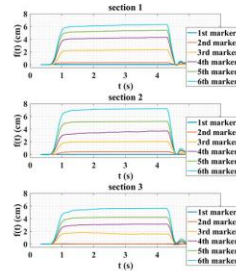
(b) Sections pattern



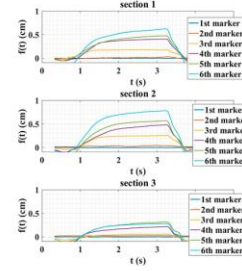
(c) Motive: Tail initial configuration



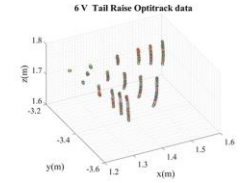
(b) Motive: Tail raise



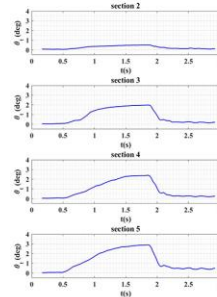
(a) Tail raise IV



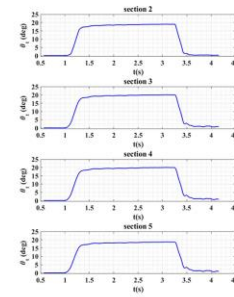
(b) Tail raise 6V



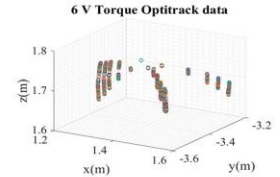
(c) Tail raise 3D



(d) Tail twist IV



(e) Tail twist 6V



(f) Tail twist 3D



# Video



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# Future work



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- Working on a new design of the Bio-Inspired Claw for allowing perching
- Working on a new model of morphing tail for real flight applications
- Searching for new applications of these actuator types



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¡Thanks for your attention!