**Artificial finger control - inverse kinematics in soft robotics**

The objective for this thesis is to find and evaluate optimal heuristic models for controlling an artificial human finger consisting of bones and flexible tendons using linear actuators. A first proposal for the model that can be discussed and evaluated is the perceptron (neural net), and distal supervised learning.

Topics:

1. CAD modeling of a suitable finger bone / joint structure
2. CAD modeling of a suitable tendon configuration
3. 3D printing of a test finger - bones / joints
4. 3D printing of tendon casting molds
5. Silicone casting of tendons
6. Linear actuator assembly
7. Assembly of complete system

*(The student can start chose to start here)*

1. **Dataset generation - linear actuator positions / finger tip XY position, camera based XY feedback**
2. **Finger function inverse kinematics modeling by artificial neural networks, DSL, etc.**

The student will focus on point 8/9 but if needed he can do a re-modeling of the physical finger test rig (point 1-7)

The linear actuators can be Dynamixel or stepper motor based, joins may be ball bearing based

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