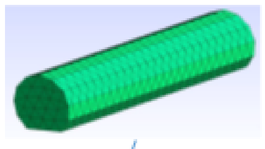
What is the approach taken by robotics to achieve better dexterity?

A SOFT DEXTEROUS MANIPULATOR INTEGRATING SMART MATERIALS

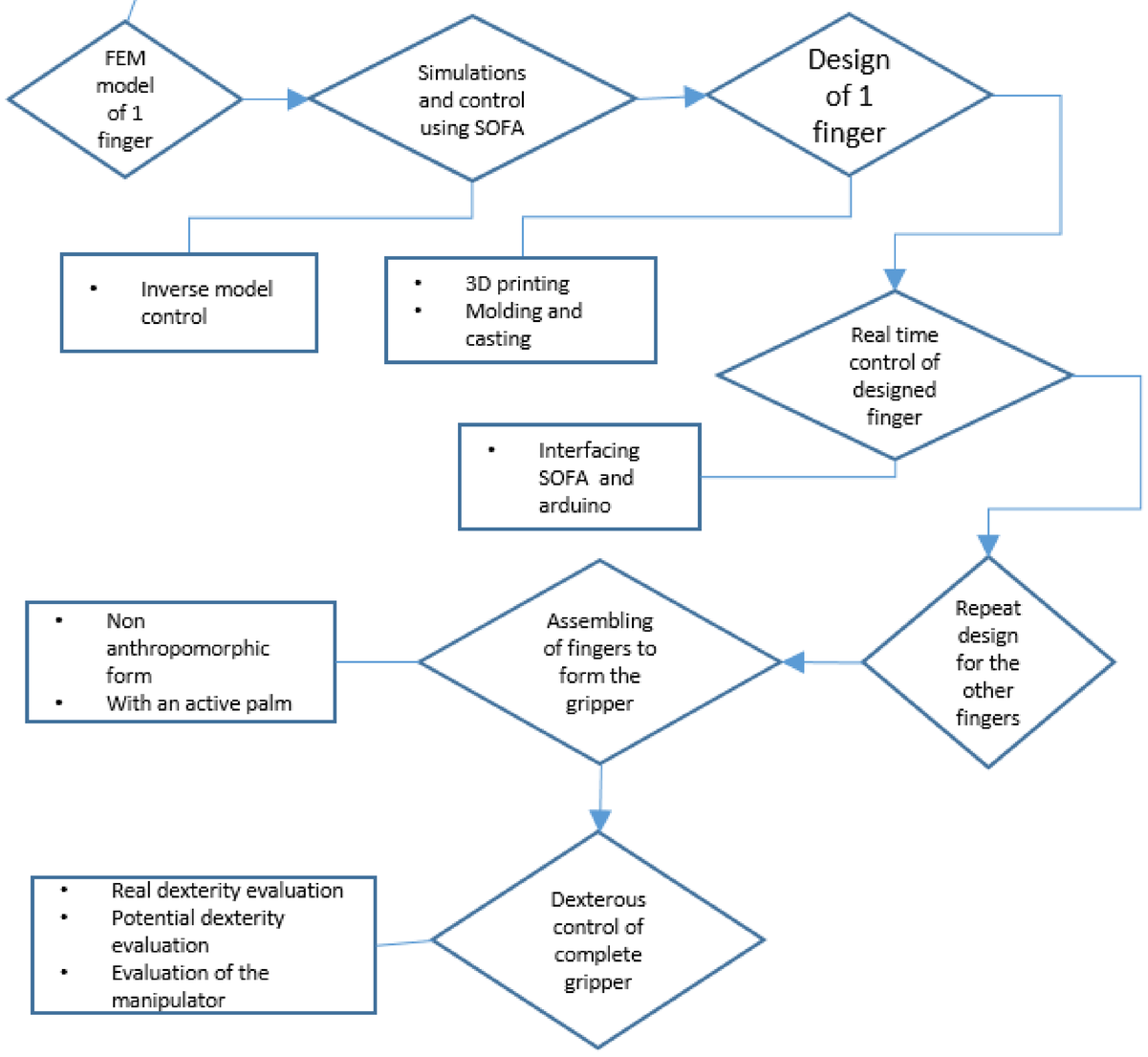
Soft Robotics and Smart Materials

BACKGROUND:

The thesis **"Smart materials for soft robotic dexterous manipulation"** aims at designing a multimaterial soft gripper which is capable of dexterous manipulations. The gripper integrates smart materials that optimize its functioning.



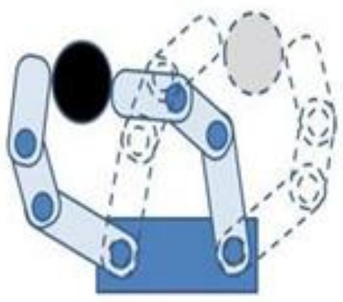
WORKFLOW:



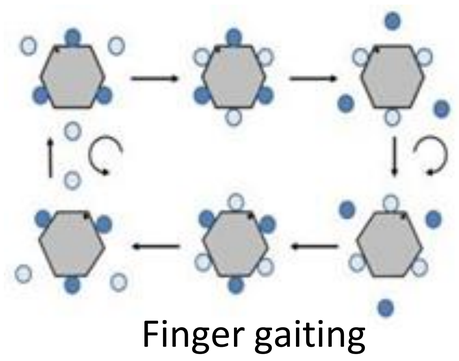
What is Dexterity ?

The skillfull performance of tasks especially with the hands.

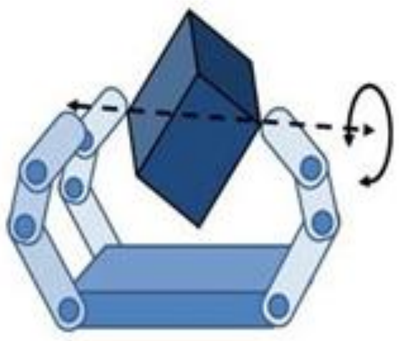
Types of Manipulations to be performed



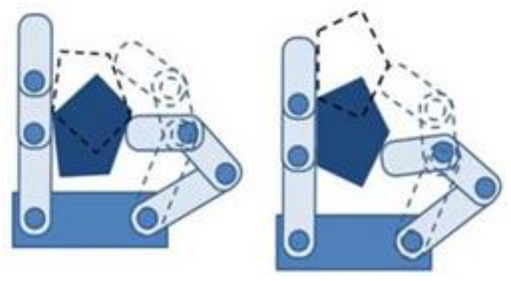
In-grasp manipulation



Finger gaiting



Finger pivoting



Rolling and Sliding

R. R. Ma y A. M. Dollar, «On dexterity and dexterous manipulation», en *2011 15th International Conference on Advanced Robotics (ICAR)*, Tallinn, Estonia, jun. 2011, pp. 1- 7. doi: 10.1109/ICAR.2011.6088576.

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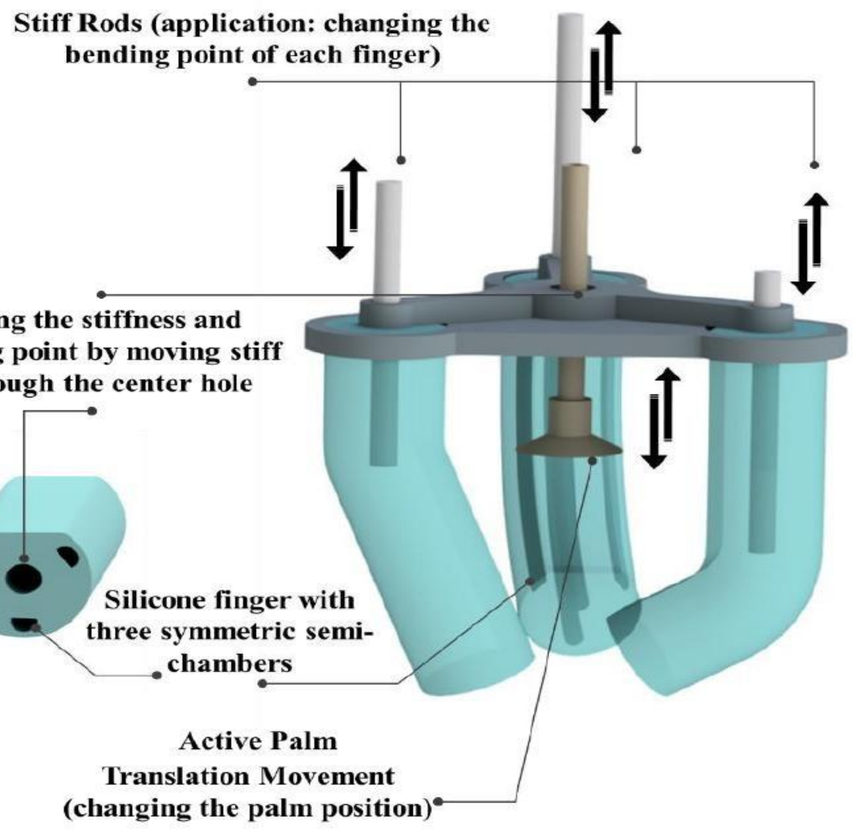

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Architecture

- Non anthropomorphic artificial hand
- At least three soft fingers

Multimaterial structure for

- Varrying the form
- Varrying the stiffness
- Auto perception

Tools:

- Catia v6 / FreeCAD
- Gmsh & Meshlab
- SOFA framework
- Python, C++, arduino