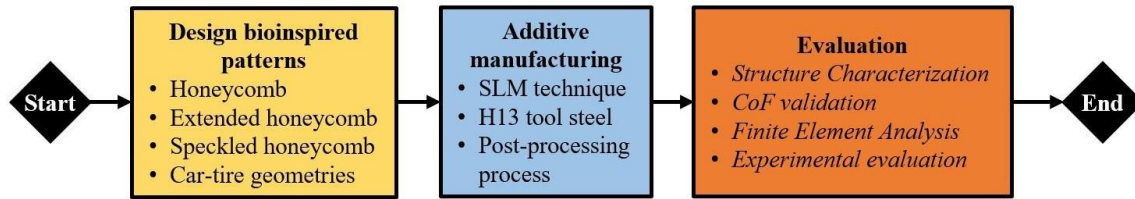


ARCHITECTURE OF THE PROPOSED SOLUTION



The key architecture steps for developing the elevator gripper friction pads with dynamic friction performance hierarchical biomimetic surface pattern are as follows:

1. **Research, selection and design of suitable biomimetic patterns:** At the beginning, in-depth literature research was carried out for the selection of suitable biomimetic patterns that enhance the tribological behavior of a surface. Then, the selected patterns were designed and adapted on the existing friction pads, so that it is possible to manufacture them and also to assemble them on the existing braking system.

2. **Manufacturing and post-processing:** In this step, the transition from the digital model to the physical one was made using innovative 3D printing techniques as well as high-strength construction material in order to enhance the mechanical behavior of the produced pads. Finally, the produced objects were optimized by employing post-processing processes (sandblasting, drilling holes, etc.) in order to obtain the best possible result.

3. **Evaluation of the construction/solution:** In this specific step, the produced pads were evaluated through a series of tests. The first inspection was visual and related to manufacturing defects. Then, tribological analysis was performed with special equipment and finite element analysis in order to derive the behavior of each structure. Finally, experimental tests were carried out under real conditions and the overall behaviors of each pattern were examined qualitatively.