

# SPORTS AND ARCHITECTURE - A DIGITAL FABRICATION LOOK

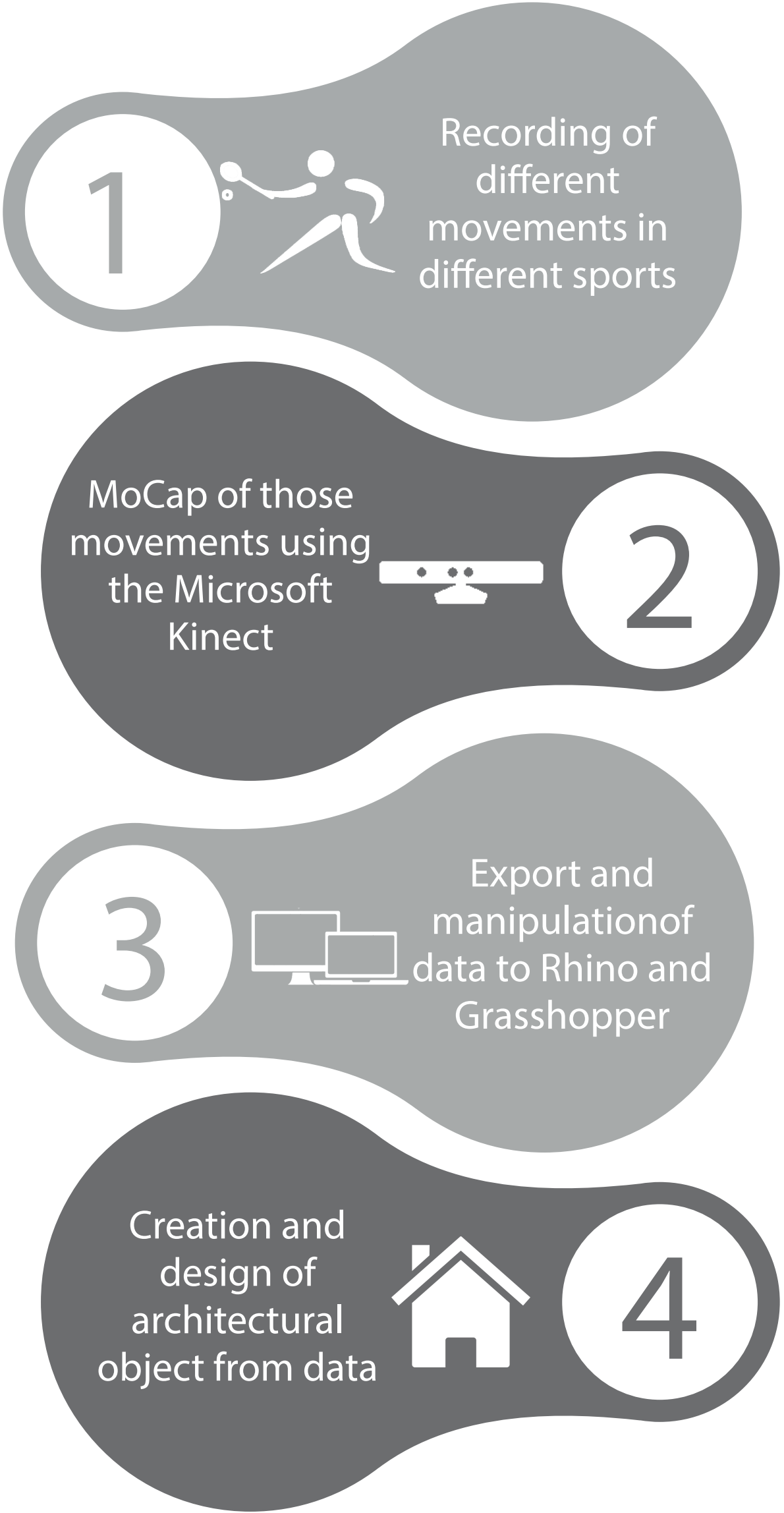
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The possibilities generated by Digital Fabrication and Digital Visualization in architecture nowadays are huge. This research will explore deeper how they can be used in conjunction to create precise parametric models using non-traditional sources of inspiration and how those can prove equally reliable in terms of inspiring beautiful and useful examples of architecture, sculpture, furniture etc.

Chicago is known for being one of the best sport cities in the nation. Not only it houses teams of the great American Leagues: Chicago Bears in the NFL, Chicago Cubs and White Sox in MLB, Chicago Blackhawks in NHL, Chicago Fire in MLS, and Chicago Bulls in NBA; but it also offers a great variety of indoor and outdoor sports activities for Chicagoans. It is not uncommon to see people running, exercising, playing different sports, all across the city, any day any time. If we look closer in why Chicago stimulates this amount of activity, one of the answers can be: its Architecture.

Although the relation might no be so clear, the architecture and urban planning of the Windy City is arranged in a way that favors the practice of activities, specially the outdoors. Chicago is full of parks, green areas, broad avenues. If we analyze the main landmarks of the city, almost all of then are ideal to exercises: Navy Pier, Grant Park, Lake Michigan Shore, Museum Campus, the Riverwalk, among others.

In this sense, it is clear that there is a relation between the sports vocation of Chicago and its design. So in this research I will explore more this relation, but in a Digital Fabrication and Visualization standpoint.



## 2. THE PROCESS

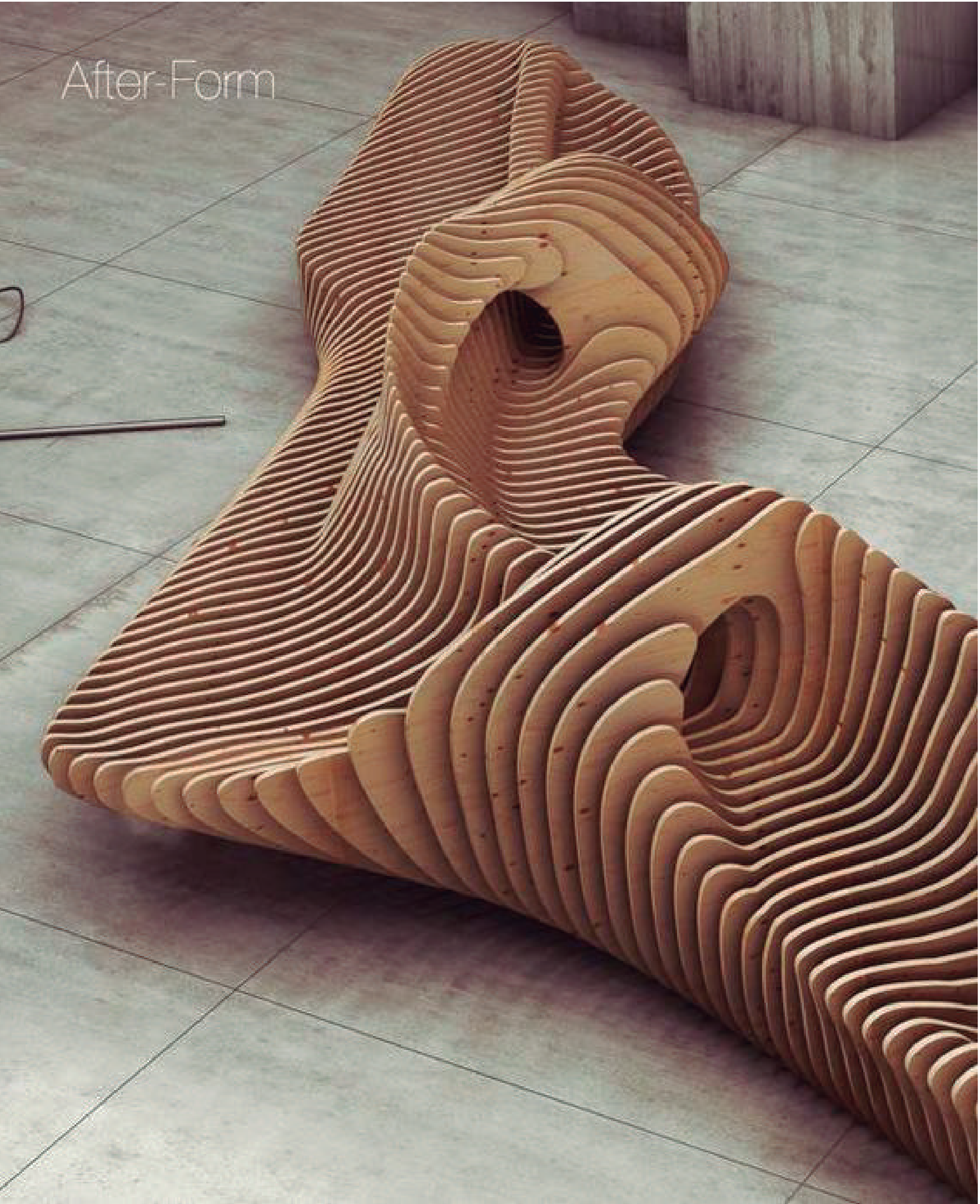
The focus will be the capture of different movements in different sports, and how this can be used as inspiration - not only conceptually but also setting parameters - to the development of the architectural object later. Although sports movements are not very common sources of inspiration in architecture, their movements are very similar to dance movements in terms of complexity and difficulty, and the latter ones are constantly used in architecture.

The research will be divided in two main stages. The first will consist in the capture of movements in sports already mentioned. For this, I will use a technique in Motion Capture (MoCap) known as optical MoCap that is basically a set of cameras that record the movement and characteristics of a person or object and triangulates its position in a digital environment. This method is constantly used in the Videogame and Movie Industry.

However, the hardware I will use is only one camera, the Microsoft Kinect. More commonly used in association with the Xbox console, this camera tracks the movement of one or more person and has a depth sensor that allows it to know precisely the position of one object in space.

The data recorded with the Kinect will be exported to two visualization software (Rhino 3D and Grasshopper) generating a point cloud based on the movement ad position captured. This point will then be manipulated and treated inside the computer to create the final architectural object.

## 3. THE OUTCOME



Based on the movement of the different sports captured, and the point cloud generated in the computer, I will create a parametric bench for each sport that celebrates the individuality of its movement. Those benches are to be placed in different areas in the city in which the sports are more practiced.

Lastly, the 3D model will be digitally fabricated (in a smaller scale) taking into consideration the materiality and machine used. In view of the different tools and materials, their choice should be made observing the advantages and disadvantages of each in different situations.