

ANALYSIS OF PERFORMANCE IN HIGH JUMP PARA-ATHLETES OF RIO OLYMPICS USING DARTFISH

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Abstract - High jump is a common path and search occurrence in International competitions. The strength of the sport to jump and reach maximum crest concerning ground level is proven present. There are abundant study patterns usable to examine the acting or to find the reasons behind individual's favorable jump. Video located reasoning is a hopeful habit to catch deeper intuitiveness into many sports. To find and learn the friendship 'tween efficiencies of favorable contestants, this research work acts a television study on three elite high jumpers the one were the top three competitors of Rio 2016 para-sports high jumping competition T42.

The television from YouTube was captured for the study. Dartfish for broadcast motion study was used to act various types of studies. The study disclosed many meaningful depiction distinctness's middle from two points win, Silver and Bronze medalists in the definitive occurrence that concede possibility be non-apparent by bare apparition or absolutely by look at the television. These minor dissimilarities are important in determining the reward triumphant strength. The intuitiveness of our work will supply valuable mechanics directions for the new throwing or jumping competition experts and coaches.

Mariyappan hails from a weak offspring of the Salem region in Tamil Nadu place he certain to try throwing or jumping competition as a sport. This influenced him to grab a golden reward at the IWAS World Junior Games 2016 in the Netherlands. The jumper cables continue activity leave in the sport and continued to challenge at the senior level³.

Key Words: High Jump Analysis, Dartfish Tagging, Para- Athletics Analysis, Video Analysis.

1. INTRODUCTION

With the establishment of new software and systems, the analysis of a sport or game has enhance ordinary to take more information about it. The information gained will be beneficial for athletes, teams and coaches to acquire information an orderly habit. High jump is less video-resolved track and throwing or jumping competition as distinguished to different occurrences. Getting detailed facts about this sport will guide for newcomers to achieve skilled without complication and fear. Different styles of jump were trained in in ancient times and Fosbury method of the 1960s is usually attended till today. The high jump maybe subdivided into three steps: approach, take-off and bar

clearance or flight⁴. Many studies had former prepared high jump in some individual or blend of these jump stages.¹The Paralympic Committee of India had appointed a 24-representative team for athletics, headlined by star javelin thrower and high jumper Mariyappan Thangavelu, for the Tokyo Paralympics. The amount of the sports contingent for Tokyo unique is more considerable than the complete contingent that make use of Rio 2016 place Mariyappan achieved golden medals. Mariyappan Thangavelu achieved golden in the T42 high jump occurrence in the 2016 Rio Paralympics. Mariyappan therefore clinched the supremacy accompanying an outstanding jump of 1.89 meters and a fleeting elevated-arm celebration, accidentally marching off. It hopeful enough for him on the midnight to top the stage³.

1.1 The Approach Run



Fig.1.1: The Approach Run

The approach run maybe more influential than the takeoff. If a high jumper runs with bad set up or beyond enough aggression, clearing the bar enhances more of a challenge. The approach demands the shape or curve this shown in the figure 1.1.

1.2 .Take off

Jumpers seeking to reach record heights usually abandon when most of their strength is managed into the upright exertion and they knock the bar off the guidelines accompanying the backs of their legs as they stay this show in the figure.1.2¹.



Fig.1.2: Take Off

1.3. Flight



Fig.1.3: Flight

They can look over their shoulder to judge when to kick both feet over their head, causing their body to clear the bar and land on the mat.

1.4 Dartfish video analysis:

They can check their shoulder to judge when to kick two together extremities over their head, provoking their body to clear the bar and jump on the fig.1.4 Dartfish program study: Dartfish is a video finding solution that admits analysts to capture, evaluate and share videos of preparation gatherings and competitions. The computer program offers tools to capture the footage directly into the podium, tag occurrences in original-occasion, and upload, organize and share the various videos created.⁶ A broadcast is presented accompanying the competition flick on individual of the screens accompanying a committee of tags and codes close it place an investigator is capable to instantaneously visualize key conduct identified and emphasize what the operation tells⁶. Dartfish Software is used by athletic coaches to break down and analyze the movements in addition to classifications videos to build an index of events (like Approach, Take off, Flight, Landing). The computer program uses digital broadcast graphics to deliver instant visual observation. Dartfish's Analyzer module is full thorough of features to help attention and understanding of movement⁶.

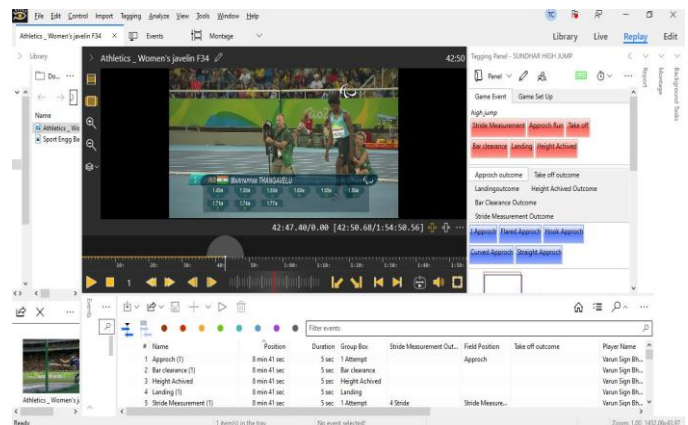


Fig.1.4: Dartfish Analysis workspace

1.5 Problem Statement:

High jump players face innumerable disadvantages that cannot be visualized for one bare eye. Athletes generally face specialized difficulties fully sorts of procedures in High jump like approach short preliminary event, take-off, action in the air, and landing. The disadvantages met for one contestant in act limits like knee angle, board contact, take off, average speed and stride length, etc. By using Dartfish video study, we can resolve the pre-occurrence broadcast of the sport acted and the dossier will be used to develop and help the player's achievement⁸.

2. Methodology

This unit specifies the collection of matters, choice of variables, choice of Parameters, the adjustment of the matters, group of dossier, and an analytical method for resolving the dossier⁸.

2.1 Data for Video Analysis

Rio 2016 Men's T42 High Jump Finals: The elite T42 men's High jump players from various nations engaged in in the ending occurrence of the Rio 2016 Olympics. The occurrence had 12 colleagues at first and was lowered to the ending three competitors. Their particulars, trail ranges, and conclusive completed heights are proved beneath Table 1⁸.

Table 1: Final Achieved Heights

RANK	NPC	ATHLETES	HEIGHT (M)	DATE
1	IND	Mariyappan Thangavelu	1.89	09-09-2016
2	USA	Sam Grewe	1.86	09-09-2016
3	IND	Varun Singh Bhati	1.86	09-09-2016

2.1.1. Tagging Panel for High Jump

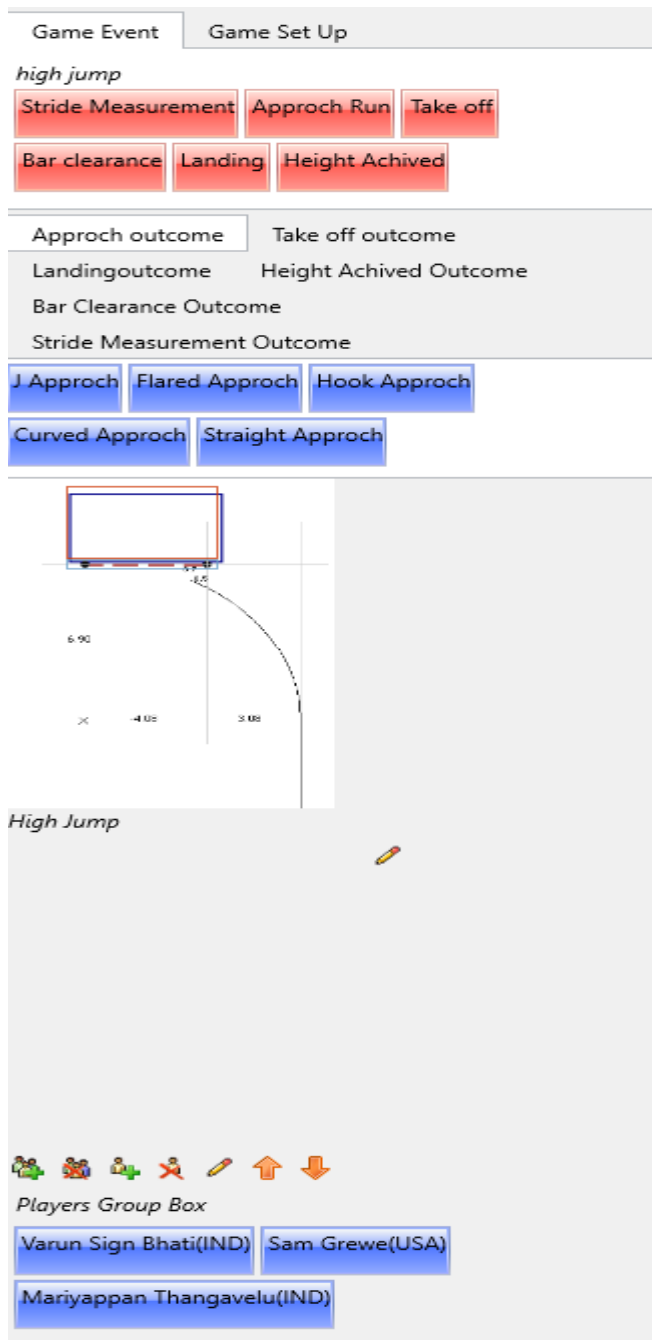


Fig.2.1.1: Dartfish Game Event panel

The figure 2.1.1 is the tagging panel setup wizard that is one of the main range of capabilities Dartfish supports us in tagging athlete's occurrences that is the keyword knob, team manager tool, and various additional region tools also⁶.

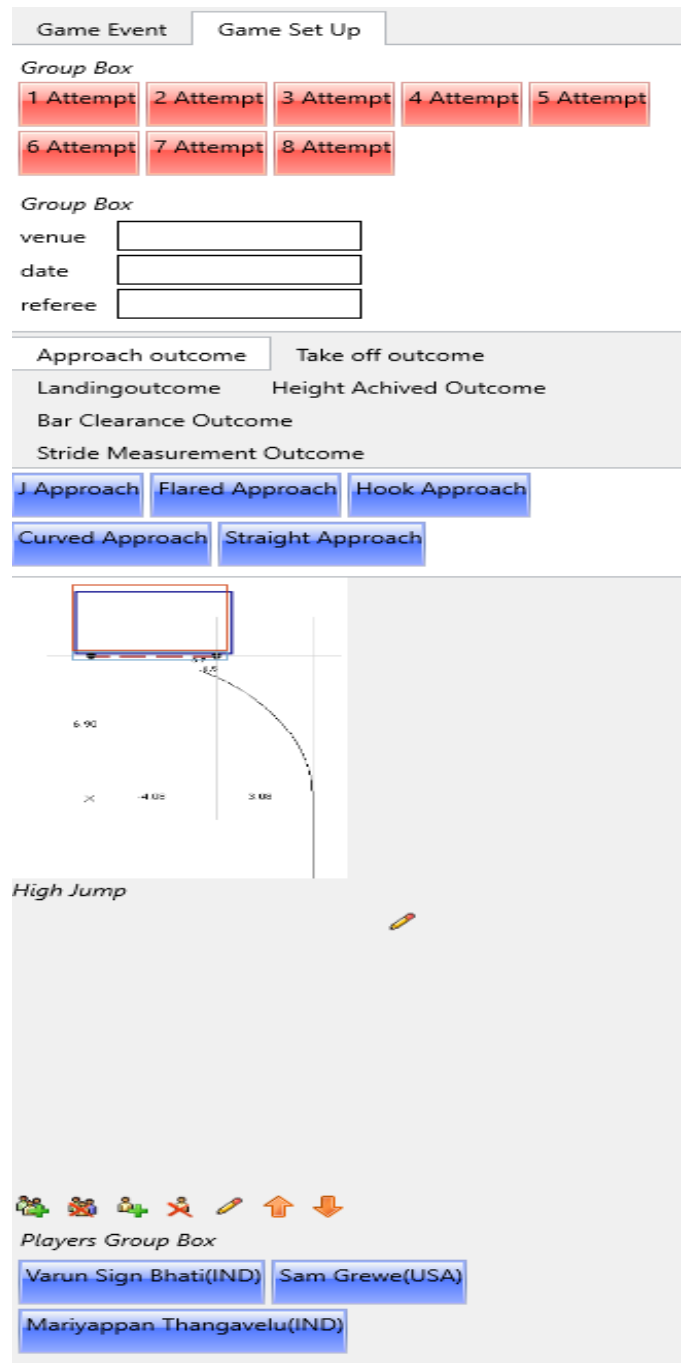


Fig.2.1.2: Dartfish Game Setup Panel

To understand the happening dossier in excel and short videos utilizing the tagging panel, I have picked the Game Rio Paralympics T42 that were held on 09-09-2016 individually. With these above competitions, our group performers couldn't execute well and they abandoned to accomplish in the competitions⁶.

3. Results and Discussion

3.1 Over All Result

Over All Result							
Player	Photo	Country	Medallists	Stride	Approach	Angle°	Maximum Height
Mariyappan Thangavelu		INDIA	Gold	4	J	106.6	1.89
Sam Grewe		USA	Silver	4	J	90	1.86
Varun Singh Bhati		INDIA	Bronze	3	Curved	120	1.86

Table 2: Over All Result

The high jump angles are captured and so forth the determined and the numerical Reports is captured by the values .there are few limited dissimilarity 'tween the gold ,silver and bronze the three performer type of process that the overall result.

3.2 Comparison of Strides

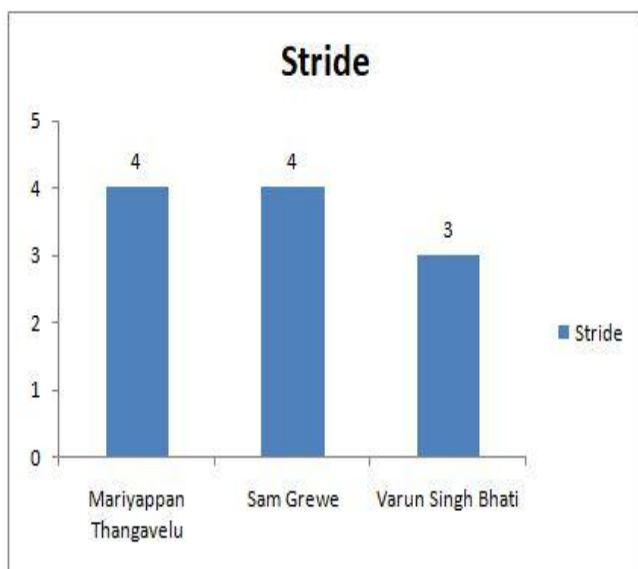


Fig.3.2: Stride Result

This above figure 3.2 shows the stride measurement of all the three athletes individually for comparative study.

3.3 Comparison of Angle

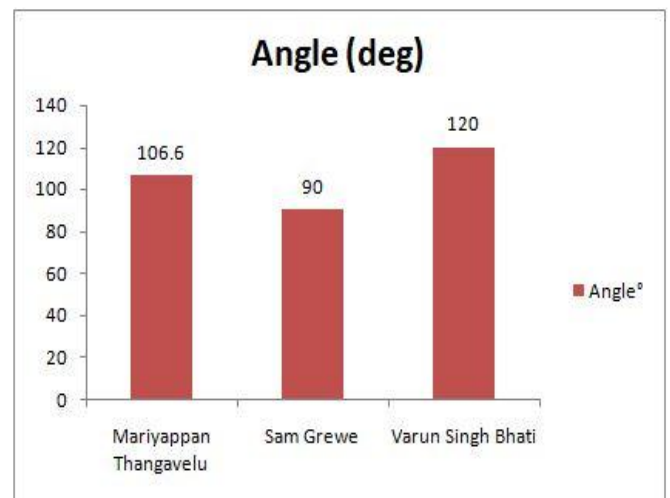


Fig.3.3: Angle Result

This above figure 3.3 shows the angle measurement of all the three athletes individually for comparative study.

3.4 Comparison of Maximum height

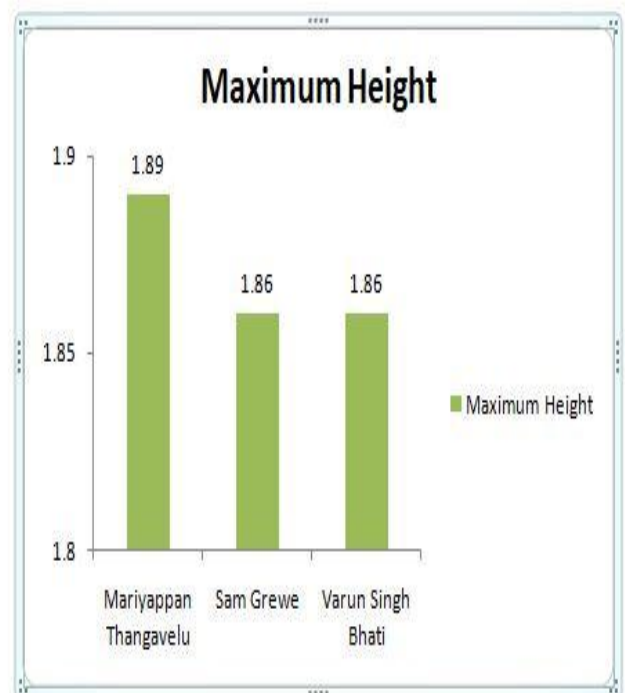


Fig.3.4: Maximum Height Result

This above figure 3.4 shows the maximum height measurement of all the three athletes individually for comparative study.

3.5 Athlete's Performance Data Visualization



Fig .3.5: Athlete's Performance Result

The Athlete's performance result shows the maximum height attained by each player in this place event occurred at Rio 2016. Every biomechanical aspects and limits of the body is very important to gain the desired height to win and again this work described here in figure.3.5 will provide the competitors to jump higher heights⁵. Along with this we can further share the same evaluation through Dartfish cloud and it possibly considered with the help of link shared to the coaches and corresponding player the one is engaging in⁶.

4. CONCLUSIONS

In this, we have performed Dartfish based video report on three top high jump performers all the while the last game of Rio Para-Olympics 2016. The evaluation was built on three aspects of high jump flexible the results to understand the medal winning abilities of these competitors. We executed angle measures, next to each other contrasting, climax judgments, etc. The purpose was not to measure the specifications, but to understand the important and minor aspects providing to the fame. The bare vision powers of individuals cannot comment these specifications. Hence, these verdicts will be advantageous for the coaches in addition to the new high jump experts all along practice. This work experiences from few imperfections. The broadcast was captured from YouTube that does not admit us to set the angle positions accurately from the angle view. The broadcast looks anticipated moving in a few places that introduced few trouble all the while finding. An orderly study utilizing own broadcast arrangement and addition of professional high jumpers in absolute-period, hopeful an excellent benefit to take deeper understanding. The unchanging report can too be widespread to different sports and games too¹.

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