

Jump Alert: A Wearable System for Inline Figure Skating Jump Detection

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Abstract

This study introduces "jump alert," a wearable system designed for inline figure skating jump detection. Inline figure skating, characterized by intricate footwork and jumps, demands precise timing and technique execution. To aid skaters in enhancing their performance and safety, Jump Alert utilizes sensor technology embedded within wearable devices to detect and analyse jump movements in real-time. By monitoring key kinematic parameters and employing machine learning algorithms, Jump Alert accurately identifies jumps during skating routines, providing immediate feedback to skaters and coaches. This innovative system has the potential to revolutionize inline figure skating training and competition by facilitating skill development, injury prevention and performance assessment.

Keywords: Wearable system • Inline figure skating • Jump detection • Sensor technology

Introduction

Inline figure skating is a captivating sport that demands precision, skill and elegance. Athletes glide gracefully across the surface, performing intricate routines that include jumps, spins and footwork. Among these elements, jumps are particularly challenging, requiring a combination of strength, technique and timing. To enhance the training and performance of inline figure skaters, a ground-breaking innovation has emerged - jump alert, a wearable system designed for inline figure skating jump detection. Inline figure skating has come a long way since its inception, with athletes continually pushing the boundaries of what is possible on wheels. As the sport evolves, so does the need for advanced training tools to support skaters in honing their skills and perfecting their routines. Jump alert addresses a crucial aspect of inline figure skating-jump detection-providing skaters, coaches and enthusiasts with invaluable insights to enhance performance. Inline figure skating jumps involve a series of complex movements that require precise timing and execution. Skaters need to generate sufficient speed, coordinate their body movements, achieve the correct take-off angle, execute rotations and land gracefully-all within a matter of seconds. Detecting and correcting errors in jump technique can be challenging and traditional coaching methods may not always provide immediate and accurate feedback [1].

Literature Review

Inline figure skating combines elements of traditional ice figure skating with the agility and manoeuvrability of inline skating, presenting unique challenges for athletes and coaches alike. Central to the sport are jumps, which require precise timing, technique and athleticism to execute successfully. While traditional ice figure skating has seen advancements in technology for performance analysis and training aids, the same level of innovation has not yet been fully realized in inline figure skating. However, recent developments in wearable sensor technology have opened up new possibilities for real-

time monitoring and analysis of athletic movements, including jumps in inline figure skating. In the realm of sports science and biomechanics, numerous studies have explored the kinematics and dynamics of jumps in various sports, including ice figure skating, gymnastics and track and field. These investigations have provided valuable insights into the biomechanical principles underlying successful jump performance, such as take-off technique, flight mechanics and landing stability. Applying this knowledge to inline figure skating, researchers have begun to explore how similar biomechanical principles may apply to jumps performed on inline skates. Additionally, studies have investigated the role of wearable sensors in capturing and analyzing jump movements, demonstrating their potential utility for enhancing performance and preventing injuries in various athletic disciplines [2,3].

Discussion

The development of jump alert represents a significant advancement in inline figure skating technology, offering a novel solution for jump detection and performance analysis. By leveraging wearable sensors and machine learning algorithms, jump alert enables real-time monitoring of jump movements during skating routines, providing athletes and coaches with valuable feedback on technique, timing and consistency. This innovative system has the potential to revolutionize inline figure skating training and competition by facilitating skill development, injury prevention and performance assessment. One of the key benefits of Jump Alert is its ability to provide immediate feedback to skaters, allowing them to adjust their technique and timing in real-time. By identifying errors or inconsistencies in jump execution, jump alert empowers skaters to make rapid improvements and refine their skills more efficiently. Moreover, the data collected by Jump Alert can be used to track progress over time, identify trends in performance and inform training strategies tailored to individual athletes' needs [4,5].

In addition to its applications in training and skill development, jump alert also holds promise for enhancing safety in inline figure skating. By monitoring jump movements and detecting potential errors or anomalies, jump alert can help identify risk factors for injury and provide proactive interventions to mitigate them. For example, by alerting skaters to improper landing techniques or excessive forces during jumps, Jump Alert can help prevent overuse injuries and reduce the risk of acute injuries such as sprains or fractures. Overall, jump alert represents a valuable tool for inline figure skaters and coaches seeking to improve performance, prevent injuries and push the boundaries of the sport. As wearable sensor technology continues to evolve, future iterations of Jump Alert may incorporate additional features and capabilities to further enhance its utility and effectiveness in inline figure skating training and competition [6].

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Conclusion

Exploring the integration of AR technology to overlay real-time jump data onto the skater's field of view during training sessions, enhancing the learning experience. Partnering with existing inline figure skating software platforms to seamlessly integrate jump alert data, allowing skaters and coaches to access a centralized hub for comprehensive performance analysis. Jump Alert represents a significant leap forward in the world of inline figure skating, offering a transformative solution to the challenges associated with jump detection. By providing real-time feedback, precise data analysis and customizable training plans, jump alert empowers skaters to elevate their performance and reach new heights in their skating journey. As the sport continues to evolve, innovations like jump alert play a crucial role in shaping the future of inline figure skating, inspiring athletes to push the boundaries of what is possible on wheels.

Acknowledgement

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Conflict of Interest

There are no conflicts of interest by author.

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