Thesis Project Portfolio

Optimizing Recovery for Female Endurance Athletes Using Machine Learning and Wearable Technology

(Technical Project)

Examining Gender Disparities in Endurance Athlete Research and Recovery Technologies

(STS Project)

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Sociotechnical Synthesis

Introduction

Both my STS research project and technical capstone aim to address critical gaps in the realm of female endurance athlete recovery and performance optimization. The anticipated deliverable of my technical project is a specialized mobile application for personalized recovery recommendations tailored to female endurance athletes. In conjunction, my STS research seeks to improve our understanding of the underlying gender disparities in sports science research and technology development, hopefully contributing to a more equitable representation of women in this space in the future. By challenging these established biases, I hope to provide female endurance athletes with tailored strategies to optimize their training and recovery, ultimately fostering gender equity in sports science and improving the overall experiences and outcomes for women in sports.

Technical Report

My technical project proposes a specialized mobile application that integrates wearable device data and employs machine learning for personalized recovery recommendations for female endurance athletes. To implement this solution, I would establish robust data collection protocols for physiological data from female endurance athletes. I would then utilize the dataset to train machine learning algorithms to give personalized recovery recommendations and create a user-friendly mobile application to facilitate easy access to these recommendations. Anticipated major outcomes would include reduced recovery times, enhanced performance, and decreased overtraining risks for female endurance athletes. Future work would involve enhancing model accuracy through an expanded dataset and real-world testing, as well as validating the recommendations' effectiveness. It would also be important to continuously monitor for potential

mobile application bugs or glitches to improve the overall user experience and facilitate ongoing collaboration with sports science experts.

STS Project

My STS project examines the gender gap in sports science research and its impact on the performance of female endurance athletes, specifically pertaining to recovery. Using the lens of feminist technoscience studies, I examined the co-constructive relationship between gender and technology. This framework highlights the interplay between social, cultural, and technological factors, emphasizing the need to critically examine how technology in sports has often been shaped by a male-centric perspective. Through feminist STS, I observed the agency exercised by individuals and communities in influencing technological norms and practices. I was able to get a better understanding of how female athletes navigate and challenge dominant technological paradigms through primary source interviews with collegiate female endurance athletes and secondary sources such as journal articles and podcasts/opinion pieces. Ultimately, I argue that the historic male-centric approach to research and technology development overlooks the unique psychological needs and experiences of female athletes, perpetuating systemic disparities within the realm of endurance athlete recovery and ultimately hindering their performance.

Conclusion

By engaging in both projects simultaneously, I was able to draw connections between the practical application of technology and the broader socio-cultural context in which it operates. My STS research provided insights into the underlying reasons for the gender bias prevalent in sports science research, which helped me to design my technical project more effectively. By examining the historical factors shaping this bias and engaging with stakeholders during my STS research, I gained a deeper understanding of why female athletes have been overlooked in

research and technology development. This awareness allowed me to approach my technical project with a more nuanced perspective, recognizing the importance of female-specific research to create a more inclusive and effective solution. My STS research helps put my technical project in context, highlighting its potential to challenge the systemic biases that have historically marginalized female endurance athletes in sports science research and technology development.