

Thesis Project Portfolio

An Interdisciplinary Approach to Sports Analytics in a University Setting

(Technical Report)

Bridging the Gap: The Potential in Performance Data Coupled with Lack of Regulation

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

As of 2019, sports analytics has grown to be a \$780 million industry. Many organizations and institutions contribute to the field through research in exercise science, optimization of in-game decision making, sports marketing, business performance, and sports compliance fields. My STS and technical projects both focused on how sports analytics can be optimized to improve performance. My technical project proposes an open, interdisciplinary approach to sports analytics within institutes of higher education to work across many fields and provide opportunities to diverse members within the community, enable research and communication across fields, serve the surrounding community, and ethically use data. My STS research focuses on that final component: ethically using the data. While sports analytics offers many benefits by using athletes' biometric data, there are ethical dilemmas concerning its storage and use.

Researchers forecast the sports analytics industry to grow into a \$5.2 billion industry by 2024. With the continuous growth of data collection and modeling techniques within the data science field, there are unique opportunities in the sports analytics industry for universities to capitalize on. Thus, the technical portion of my thesis produced an interdisciplinary sports analytics center with the following main objectives: become synonymous with service, cultivate vibrant communities, enable discoveries that enrich lives, strengthen foundations, and ensure ethical data collection and transparency. The more specific details related to the creation of the center fell within four key dimensions: physical, educational and institutional, outreach, and research. In addition, research was conducted on both the Women's Volleyball and Men's Lacrosse team's data to showcase potential projects for students in the future center. While the technical project was a case study implementing this type of center specifically at UVa, different institutes can implement a comparable pan-university center through similar steps.

The collection of collegiate biometric data has vast benefits for the health of current and former athletes. However, athletes' performance data may be at risk of exposure to third parties, and athletes may not have control over how their data is used. In my STS research, I point out the benefits that analyzing biometric data can offer as well as the potential privacy and security risks that may result from lack of regulation. Emmanuel Mesthene presents a model for thinking about the contingent but predictable process by which technological innovation can lead to both conflict and social innovation. I applied this model to the domain of collegiate biometric data to understand which values and beliefs were most strained and why. My research found that the values of health and safety were compromised by corporate greed and as a result I called for organizational and cultural innovation from the NCAA to remedy this ethical problem.

My STS and technical research projects combined to illustrate that implementing a new technology requires careful consideration of all stakeholders and steps involved. The research conducted on both fronts shows the potential benefits that sports analytics can offer to a community, but there are also ethical pitfalls that need to be monitored and discussed prior to execution. Designing the center from a technical perspective and then analyzing the data concerns from an STS perspective taught me how to appreciate the perspectives of all stakeholders before arriving at a conclusion. In addition, I've learned how to apply Mesthene's model of the relationship between technological and social change to any domain.