

## BOOK REVIEW

Fujii, K. (2025). *Machine Learning in Sports: Open Approach for Next Play Analytics*. Springer. <https://doi.org/10.1007/978-981-96-1445-5>

### Reviewed by

ChienMin Kuo

Baseball Innovation League Association

*Sports Pioneer Journal* (eISSN: 3070-0353)

The increasing integration of artificial intelligence and advanced analytics into professional sport has fundamentally reshaped how teams evaluate performance, design tactics, and generate competitive advantage. In *Machine Learning in Sports: Open Approach for Next Play Analytics*, Keisuke Fujii (2025) presents a timely and methodologically rigorous exploration of machine learning applications within sports environments. As data-driven innovation becomes central to organizational strategy in professional leagues, this volume offers both conceptual clarity and technical guidance for researchers and practitioners seeking to understand predictive modeling in sport contexts.

Fujii's central premise is that next-play analytics—defined as probabilistic modeling designed to anticipate imminent in-game actions—represents a frontier in sports analytics research. The book begins by outlining foundational machine learning principles, including supervised and unsupervised learning, classification, regression techniques, and model evaluation frameworks. Rather than offering purely abstract explanations, Fujii situates these methods within sports data ecosystems, such as player tracking systems, event-based datasets, and real-time performance metrics. This applied orientation strengthens the book's accessibility for interdisciplinary audiences bridging computer science and sport management.

A notable contribution of the text is its emphasis on reproducibility and transparency. The “open approach” advocated by Fujii aligns with contemporary scholarly standards promoting replicable research designs and open-source modeling practices. In a field often constrained by proprietary data and closed analytical systems, this commitment to methodological openness is both ethically significant and academically progressive. By detailing model validation techniques and performance evaluation metrics, the author encourages critical scrutiny rather than blind adoption of algorithmic outputs.

Subsequent chapters delve into feature engineering strategies and contextual modeling challenges unique to sports. Fujii acknowledges that sports performance data are inherently dynamic, nonlinear, and context-dependent. Issues such as data imbalance, situational variability, and temporal dependencies complicate predictive accuracy. The discussion of overfitting and model generalizability is particularly valuable, as many applied sport analytics projects struggle to balance precision with robustness. The text effectively demonstrates how rigorous model validation frameworks can mitigate these risks.

From a critical perspective, the book's greatest strength lies in its methodological coherence. Fujii successfully integrates statistical reasoning with practical implementation, offering readers both theoretical foundations and operational insight. The mathematical explanations are presented with sufficient clarity to support graduate-level understanding, while remaining grounded in sports applications. This dual emphasis enhances the book's utility for scholars in sport analytics, engineering, and innovation studies.

Nevertheless, the technical orientation may present challenges for readers without prior exposure to statistical modeling or programming concepts. While Fujii attempts to maintain accessibility, certain sections presume familiarity with machine learning terminology. Readers from purely managerial or coaching backgrounds may require supplementary resources to fully engage with the material. Additionally, although the frameworks are broadly applicable across sports, more detailed sport-specific case studies—particularly within globally prominent leagues such as professional baseball—could further strengthen the applied dimension of the work.

In terms of contribution, *Machine Learning in Sports* advances scholarly dialogue at the intersection of technology adoption, performance optimization, and innovation management. As professional baseball and other competitive leagues increasingly rely on tracking technologies and algorithmic decision-support systems, understanding the computational infrastructure underlying these innovations becomes essential. Fujii's framework provides a foundation for evaluating not only predictive accuracy but also organizational implementation strategies and ethical considerations surrounding data governance.

For researchers examining sport innovation ecosystems, the text offers methodological tools that can inform empirical studies on competitive balance, tactical efficiency, and player development systems. For practitioners, it clarifies the analytical logic behind next-play modeling, thereby facilitating more informed collaboration between data scientists and coaching staff. The open-access availability of the volume further enhances its scholarly reach, enabling broader dissemination across academic and professional communities.

Overall, Fujii's work represents a significant and timely contribution to sports analytics literature. While deeper sport-specific exemplification would enhance its practical resonance, the book succeeds in articulating a coherent and forward-looking framework for machine learning integration in sport. For scholars and professionals seeking to understand the evolving architecture of data-driven competition, *Machine Learning in Sports* offers both conceptual insight and methodological rigor.