

## References

- Adams, T., Birkenbihl, C., Otte, K., Ng, H. G., Rieling, J. A., Näher, A.-F., Sax, U., Prasser, F., & Fröhlich, H. (2025). On the fidelity versus privacy and utility trade-off of synthetic patient data. *iScience*, 28(5), 112382. <https://doi.org/10.1016/j.isci.2025.112382>
- Adjust. (2024, July 30). Insights into what makes a good mobile app eCPI. Adjust. <https://www.adjust.com/blog/ecpi-benchmarks/>
- Agile Alliance. (2001). Manifesto for Agile Software Development. <https://agilemanifesto.org/>
- Apple Developer. (n.d.). App Store Small Business Program. Apple Developer. <https://developer.apple.com/app-store/small-business-program/>
- Apple. (n.d.). Apple One (Ireland) – Apple Fitness+ monthly pricing. Apple. <https://www.apple.com/ie/apple-one/>
- Banister, E. W. (1991). Modeling elite athletic performance. In J. D. MacDougall, H. A. Wenger, & H. J. Green (Eds.), *Physiological Testing of the High-Performance Athlete* (2nd ed.). Human Kinetics. Available via Google Books search: <https://books.google.com/books?q=Physiological%20Testing%20of%20the%20High-Performance%20Athlete%202nd%20edition%20Human%20Kinetics%20Banister%201991>
- Bawden, D., & Robinson, L. (2009). The dark side of information: Overload, anxiety and other paradoxes and pathologies. *Journal of Information Science*, 35(2), 180–191. <https://doi.org/10.1177/0165551508095781>
- Bertelsen, M. L., Hulme, A., Petersen, J., Brund, R. K., Sørensen, H., Finch, C. F., & Nielsen, R. O. (2017). A framework for the etiology of running-related injuries. *Scandinavian Journal of Medicine & Science in Sports*, 27(11), 1170–1180. <https://doi.org/10.1111/sms.12883>
- Bessemer Venture Partners. (n.d.). BVP Nasdaq Emerging Cloud Index. <https://cloudindex.bvp.com/>
- Brier, G. W. (1950). Verification of forecasts expressed in terms of probability. *Monthly Weather Review*, 78(1), 1–3. [https://doi.org/10.1175/1520-0493\(1950\)078<0001:VOFEIT>2.0.CO;2](https://doi.org/10.1175/1520-0493(1950)078<0001:VOFEIT>2.0.CO;2)
- Camma Damsted, C., Glad, S., Nielsen, R. Ø., & Sørensen, H. (2018). Is there evidence for an association between changes in training load and running-related injuries? A systematic review. *International Journal of Sports Physical Therapy*, 13(6), 931–942. PubMed search: <https://pubmed.ncbi.nlm.nih.gov/?term=Is%20there%20evidence%20for%20an%20association%20between%20changes%20in%20training%20load%20and%20running-related%20injuries%20A%20systematic%20review%20Damsted%202018>
- Chapman, P., Clinton, J., Kerber, R., Khabaza, T., Reinartz, T., Shearer, C., & Wirth, R. (2000). CRISP-DM 1.0: Step-by-step data mining guide. SPSS. IBM SPSS Modeler documentation (CRISP-DM overview): <https://www.ibm.com/docs/en/spss-modeler>
- Chen, T., & Guestrin, C. (2016). XGBoost: A scalable tree boosting system. *Proceedings of the 22nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, 785–794. <https://doi.org/10.1145/2939672.2939785>
- Collins, G. S., Moons, K. G. M., et al. (2024). TRIPOD+AI statement: updated guidance for reporting clinical prediction models that use artificial intelligence. *BMJ*, 385, e078378. <https://doi.org/10.1136/bmj-2023-078378>
- Collins, G. S., Reitsma, J. B., Altman, D. G., & Moons, K. G. M. (2015). Transparent Reporting of a multivariable prediction model for Individual Prognosis Or Diagnosis (TRIPOD). *Annals of Internal Medicine*, 162(1), 55–63. <https://doi.org/10.7326/M14-0697>

- Damodaran, A. (2009). Valuing young, start-up and growth companies: Estimation issues and valuation challenges. NYU Stern School of Business.  
<https://pages.stern.nyu.edu/~adamodar/pdf/papers/younggrowth.pdf>
- Data Protection Commission (Ireland). (2025). Special Category Data (GDPR Article 9).  
<https://www.dataprotection.ie/en/organisations/know-your-obligations/lawful-processing/special-category-data>
- Düking, P., Zinner, C., Trabelsi, K., Reed, J. L., Holmberg, H.-C., Kunz, P., & Sperlich, B. (2021). Monitoring and adapting endurance training on the basis of heart rate variability monitored by wearable technologies: A systematic review with meta-analysis. *Journal of Science and Medicine in Sport*, 24(11), 1180–1192. <https://doi.org/10.1016/j.jsams.2021.04.012>
- EDPB. (2020). Guidelines 4/2019 on Article 25 Data Protection by Design and by Default (Version 2.0). European Data Protection Board. [https://www.edpb.europa.eu/our-work-tools/our-documents/guidelines-42019-article-25-data-protection-design-and\\_en](https://www.edpb.europa.eu/our-work-tools/our-documents/guidelines-42019-article-25-data-protection-design-and_en)
- EDPB. (2019/2020). Guidelines 4/2019 on Article 25 Data Protection by Design and by Default (Final). European Data Protection Board.  
[https://www.edpb.europa.eu/sites/default/files/files/file1/edpb\\_guidelines\\_201904\\_dataprotection\\_by\\_design\\_and\\_by\\_default\\_v2.0\\_en.pdf](https://www.edpb.europa.eu/sites/default/files/files/file1/edpb_guidelines_201904_dataprotection_by_design_and_by_default_v2.0_en.pdf)
- Eppler, M. J., & Mengis, J. (2004). The concept of information overload: A review of literature from organization science, accounting, marketing, MIS, and related disciplines. *The Information Society*, 20(5), 325–344. <https://doi.org/10.1080/01972240490507974>
- European Data Protection Board. (2025). Guidelines 01/2025 on Pseudonymisation.  
[https://www.edpb.europa.eu/system/files/2025-01/edpb\\_guidelines\\_202501\\_pseudonymisation\\_en.pdf](https://www.edpb.europa.eu/system/files/2025-01/edpb_guidelines_202501_pseudonymisation_en.pdf)
- European Union. (2016). Regulation (EU) 2016/679 (General Data Protection Regulation), Article 9 (processing of special categories of personal data). EUR-Lex. <https://eur-lex.europa.eu/eli/reg/2016/679/oj/eng>
- Fortune Business Insights. (2025, March 19). mHealth Apps Market to Grow at a CAGR of 11.8% by 2032. <https://www.fortunebusinessinsights.com/press-release/mhealth-apps-market-9540>
- Frandsen, J. S. B., Hulme, A., Parner, E. T., Møller, M., Lindman, I., Abrahamson, J., Simonsen, N. S., Jacobsen, J. S., Ramskov, D., Skejø, S., Malisoux, L., Bertelsen, M. L., & Nielsen, R. O. (2025). How much running is too much? Identifying high-risk running sessions in a 5200-person cohort study. *British Journal of Sports Medicine*, 59(17), 1203–1210. <https://doi.org/10.1136/bjsports-2024-109380>
- Gabbett, T. J. (2016). The training—injury prevention paradox: Should athletes be training smarter and harder? *British Journal of Sports Medicine*, 50(5), 273–280.  
<https://doi.org/10.1136/bjsports-2015-095788>
- Garmin. (n.d.). Training Readiness (Owner's Manual). Garmin.  
<https://www8.garmin.com/manuals/webhelp/GUID-626B0002-B026-4032-B7A5-7321047B8300/EN-US/GUID-C21BE0C8-A08E-4DA1-B6C6-2E0E2DDDB372.html>
- Gonçalves, A. R., Ray, P., Soper, B., Stevens, J. L., Coyle, L., Sales, A. P., et al. (2020). Generation and evaluation of synthetic patient data. *BMC Medical Research Methodology*, 20, 108.  
<https://doi.org/10.1186/s12874-020-00977-1>
- Google Play Console Help. (n.d.). Service fees. Google Support.  
<https://support.google.com/googleplay/android-developer/answer/112622>
- Grand View Research. (2025). Fitness App Market Size & Trends (2025–2033).  
<https://www.grandviewresearch.com/industry-analysis/fitness-app-market>

- Guo, C., Pleiss, G., Sun, Y., & Weinberger, K. Q. (2017). On calibration of modern neural networks. arXiv:1706.04599. <https://arxiv.org/abs/1706.04599>
- Hespanhol Junior, L. C., Huisstede, B. M. A., Smits, D.-W., Kluitenberg, B., van der Worp, H., van Middelkoop, M., & Verhagen, E. A. L. M. (2016). The NLstart2run study: Economic burden of running-related injuries in novice runners participating in a novice running program. *Journal of Science and Medicine in Sport*, 19(10), 800–804. <https://pubmed.ncbi.nlm.nih.gov/?term=NLstart2run%20study%20economic%20burden%20running-related%20injuries%20novice%20runners%202016%20Journal%20of%20Science%20and%20Medicine%20in%20Sport>
- Hespanhol Junior, L. C., van Mechelen, W., & Verhagen, E. (2016). The economic burden of running-related injuries in novice runners: A prospective cohort study. *Journal of Science and Medicine in Sport*, 19(10), 800–804. PubMed search: <https://pubmed.ncbi.nlm.nih.gov/?term=economic%20burden%20of%20running-related%20injuries%20in%20novice%20runners%20Hespanhol%202016%20Journal%20of%20Science%20and%20Medicine%20in%20Sport>
- Hottenrott, L., Hoos, O., & Esperer, H.-D. (2021). Utilizing heart rate variability for coaching athletes during and after viral infection: A case report in an elite endurance athlete. *Frontiers in Sports and Active Living*, 3, 612782. <https://doi.org/10.3389/fspor.2021.612782>
- ICO. (n.d.). Chapter 4: Accountability and governance (Anonymisation guidance). Information Commissioner's Office. <https://ico.org.uk/media2/migrated/4019713/chapter-4-anonymisation-guidance-accountability-and-governance.pdf>
- IDC. (2025, October 21). Wearable Devices Market Insights (Q2 2025 shipments). <https://www.idc.com/promo/wearablevendor/>
- Information Commissioner's Office (ICO). (2025). Anonymisation and pseudonymisation: Guidance (UK GDPR). <https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/data-sharing/anonymisation/about-this-guidance/>
- International Organization for Standardization (ISO). (2020). ISO 21502:2020 — Project, programme and portfolio management — Guidance on project management. <https://www.iso.org/standard/74947.html>
- Intervals.icu. (2026). Sports analytics and planning (example charts). <https://intervals.icu/>
- ISO. (2019). ISO 9241-210:2019 — Ergonomics of human-system interaction — Human-centred design for interactive systems. International Organization for Standardization. <https://www.iso.org/standard/77520.html>
- ISO. (2022). ISO/IEC 27001:2022 — Information security management systems. International Organization for Standardization. <https://www.iso.org/standard/27001>
- Ke, G., Meng, Q., Finley, T., Wang, T., Chen, W., Ma, W., Ye, Q., & Liu, T.-Y. (2017). LightGBM: A highly efficient gradient boosting decision tree. In Advances in Neural Information Processing Systems (NeurIPS). <https://papers.nips.cc/paper/6907-lightgbm-a-highly-efficient-gradient-boosting-decision-tree>
- Little, R. J. A., & Rubin, D. B. (2002). Statistical Analysis with Missing Data (2nd ed.). Wiley. <https://onlinelibrary.wiley.com/doi/book/10.1002/9781119013563>
- Liu, X., Rivera, S. C., Moher, D., Calvert, M. J., & Denniston, A. K. (2020). Reporting guidelines for clinical trial reports for interventions involving artificial intelligence: The CONSORT-AI extension. *BMJ*, 370, m3164. <https://www.bmj.com/content/370/bmj.m3164>

- Lövdal, S. S., Den Hartigh, R. J. R., & Azzopardi, G. (2021). Injury prediction in competitive runners with machine learning. *International Journal of Sports Physiology and Performance*, 16(10), 1522–1531. <https://doi.org/10.1123/ijsspp.2020-0518>
- Lövdal, S. S., den Hartigh, R. J. R., & Azzopardi, G. (2021). Replication Data for: Injury Prediction in Competitive Runners With Machine Learning. DataverseNL. <https://doi.org/10.34894/UWU9PV>
- MarketsandMarkets. (2025). Wearable Technology Market – Global Forecast to 2030. <https://www.marketsandmarkets.com/Market-Reports/wearable-electronics-market-983.html>
- Medicines and Healthcare products Regulatory Agency (MHRA). (2021). Software and AI as a Medical Device Change Programme. GOV.UK. <https://www.gov.uk/government/publications/software-and-ai-as-a-medical-device-change-programme>
- Medicines and Healthcare products Regulatory Agency (MHRA). (2014). Medical devices: software applications (apps). GOV.UK. <https://www.gov.uk/government/publications/medical-devices-software-applications-apps>
- Medicines and Healthcare products Regulatory Agency (MHRA). (2024). Regulating medical devices in the UK (overview guidance). GOV.UK. <https://www.gov.uk/guidance/regulating-medical-devices-in-the-uk>
- Milewski, M. D., Skaggs, D. L., Bishop, G. A., Pace, J. L., Ibrahim, D. A., Wren, T. A. L., & Barzdukas, A. (2014). Chronic lack of sleep is associated with increased sports injuries in adolescent athletes. *Journal of Pediatric Orthopaedics*, 34(2), 129–133. <https://doi.org/10.1097/BPO.0000000000000151>
- Nelson, E. O., et al. (2019). Development of the University of Wisconsin Running Injury and Recovery Index. *J Orthop Sports Phys Ther*, 49(10), 751–760. <https://doi.org/10.2519/jospt.2019.8868>
- Oura. (n.d.). Oura Membership. <https://ouraring.com/membership/>
- OWASP. (n.d.). Mobile Application Security Verification Standard (MASVS). OWASP Mobile Application Security. <https://mas.owasp.org/MASVS/>
- Pla, R., et al. (2021). Resting heart rate measurement in elite athletes during COVID-19 lockdown: A new approach to assess health and performance. *Sustainability*, 13(5), 2970. <https://doi.org/10.3390/su13052970>
- Post Affiliate Pro. (2025, December 28). SaaS affiliate marketing commission rates and structures. Post Affiliate Pro. <https://www.postaffiliatepro.com/blog/saas-affiliate-commission-rates/>
- Prokhorenkova, L., Gusev, G., Vorobev, A., Dorogush, A. V., & Gulin, A. (2018). CatBoost: unbiased boosting with categorical features. arXiv:1706.09516. <https://arxiv.org/abs/1706.09516>
- RevenueCat. (2025). State of Subscription Apps 2025. RevenueCat. <https://www.revenuecat.com/state-of-subscription-apps-2025/>
- Rewardful. (2023, June 30). Affiliate commission guide for SaaS. Rewardful. <https://www.rewardful.com/articles/affiliate-commission-explained>
- Ries, E. (2011). *The Lean Startup*. Crown Business. Publisher page: <https://www.penguinrandomhouse.com/books/210088/the-lean-startup-by-eric-ries/>
- Rivera, S. C., Liu, X., Chan, A.-W., Denniston, A. K., & Calvert, M. J. (2020). Guidelines for clinical trial protocols for interventions involving artificial intelligence: the SPIRIT-AI extension. *BMJ*, 370, m3210. <https://www.bmj.com/content/370/bmj.m3210>
- Rubin, D. B. (1976). Inference and missing data. *Biometrika*, 63(3), 581–592. <https://doi.org/10.1093/biomet/63.3.581>
- Russell, H. C., & Wiese-Bjornstal, D. M. (2015). *Narratives of psychosocial response to microtrauma injury among long-distance runners*. *Sports*, 3(3), 159–177. <https://doi.org/10.3390/sports3030159>

- Runalyze. (2026). Example training analytics dashboards. <https://runalyze.com/>
- Runalyze. (n.d.). Pricing. <https://runalyze.com/pricing/>
- SaaS Capital. (2025, January 24). 2025 Private SaaS Company Valuations (The SaaS Capital Index). SaaS Capital. <https://www.saas-capital.com/blog-posts/private-saas-company-valuations-multiples/>
- Saito, T., & Rehmsmeier, M. (2015). The precision–recall plot is more informative than the ROC plot when evaluating binary classifiers on imbalanced datasets. *PLOS ONE*, 10(3), e0118432. <https://doi.org/10.1371/journal.pone.0118432>
- Sports & Fitness Industry Association (SFIA). (2025, February 27). SFIA's Topline Participation Report shows 247.1 million Americans were active in 2024. <https://sfia.org/resources/sfias-topline-participation-report-shows-247-1-million-americans-were-active-in-2024/>
- Strava. (2025a). Year in Sport 2025: What it means for brands. <https://business.strava.com/resources/year-in-sport-brands-2025>
- Strava. (2025b, April 17). Strava to acquire Runna, a leading running training app. <https://press.strava.com/articles/strava-to-acquire-runna-a-leading-running-training-app>
- Strava. (2025c, July 1). Pricing – Updating subscription prices. <https://www.strava.com/pricing>
- StrideWise Development Team. (2025). COMPLETE\_SYSTEM\_DOCUMENTATION: Synthetic Runner Data Generation and Injury Prediction (Version 1.0). See Appendix 2.
- StrideWise. (2026). MSBA Capstone Written Report (StrideWise internal report, Word manuscript).
- The Verge. (2025, March 27). Garmin adds AI and a subscription tier to its app. <https://www.theverge.com/news/636211/garmin-connect-plus-subscription-wearables>
- TrainingPeaks. (2026). Adding a Chart to your Dashboard (Help Center). <https://help.trainingpeaks.com/hc/en-us/articles/115004963667-Adding-a-Chart-to-your-Dashboard>
- TrainingPeaks. (n.d.). Pricing for Athletes. <https://www.trainingpeaks.com/pricing/for-athletes/>
- Tukey, J. W. (1977). Exploratory Data Analysis. Addison-Wesley. <https://www.amazon.co.uk/Exploratory-Data-Analysis-Behavioral-Science/dp/0201076160>
- UK Information Commissioner's Office (ICO). (2024). Special category data (UK GDPR) – guidance. <https://ico.org.uk/for-organisations/uk-gdpr-guidance-and-resources/lawful-basis/special-category-data/>
- Vallevik, V. B., Babic, A., et al. (2024). Can I trust my fake data – A comprehensive quality assessment framework for synthetic tabular data in healthcare. *International Journal of Medical Informatics*, 185, 105413. <https://doi.org/10.1016/j.ijmedinf.2024.105413>
- van der Worp, M. P., ten Haaf, D. S. M., van Cingel, R., de Wijer, A., Nijhuis-van der Sanden, M. W. G., & Staal, J. B. (2015). Injuries in runners; a systematic review on risk factors and sex differences. *PLOS ONE*, 10(2), e0114937. <https://doi.org/10.1371/journal.pone.0114937>
- Videbæk, S., Bueno, A. M., Nielsen, R. O., & Rasmussen, S. (2015). Incidence of running-related injuries per 1000 h of running in different types of runners: A systematic review and meta-analysis. *Sports Medicine*, 45(7), 1017–1026. <https://doi.org/10.1007/s40279-015-0333-8>
- Visser, T. S. O. S., et al. (2021). The socio-economic impact of running-related injuries: A large prospective cohort study. *Scandinavian Journal of Medicine & Science in Sports*, 31(9), 1781–1792. <https://doi.org/10.1111/sms.14016>
- W3C. (2023). WCAG 2.2 is a Web Standard “W3C Recommendation”. Web Accessibility Initiative. <https://www.w3.org/WAI/news/2023-10-05/wcag22rec/>

- Watson, A., et al. (2020). Decreased sleep is an independent predictor of in-season injury in collegiate athletes. *Orthopaedic Journal of Sports Medicine*, 8(11).
- <https://doi.org/10.1177/2325967120964481>
- WHOOP. (2025, November 4). Membership Pricing.  
<https://support.whoop.com/s/article/Membership-Pricing>
- Wolff, R. F., et al. (2019). PROBAST: A tool to assess the risk of bias and applicability of prediction model studies. *Annals of Internal Medicine*, 170(1), 51–58. <https://doi.org/10.7326/M18-1376>
- ŌURA. (n.d.). Membership Pricing. Ōura Support. <https://support.ouraring.com/hc/en-us/articles/360025577993-Membership-Pricing>
- ŌURA. (n.d.-b). Oura Ring 4 – product pricing (from \$349). <https://ouraring.com/store/rings/oura-ring-4/black>

#### Note

The author used the following AI systems to aid in the production of this paper, and the accompanying code base:

- ChatGPT: Research and experimentation – especially in regard to researching injury causation mechanisms.
- NotebookLM: Research and slide deck creation (specifically the deck as indicated in Appendix 3).
- Cursor (primarily utilising Claude): Research, experimentation, coding, code documentation.
- Runway (primarily utilising Nano Banana): Image creation (based on scanned drawings as created by the author).

All the code was run and tested on an Apple MacBook Pro using PyCharm as the primary IDE.

The author acknowledges accountability for the content in this document, and recognize that AI tool use disclosure does not excuse responsibility for errors, inaccuracies, or plagiarism.