

Wax it to Win it: a Golden Algorithm for Team Canada

Introduction and Background

I'm Sitka, a 14-year-old cross-country ski racer in Whitehorse, Yukon. Last year for the CWSF, I tested various fluoro-free waxes to race faster – which led me to a complex world of factors that influence ski glide. Then I learned that even Team Canada still relies on time-consuming trial-and-error for wax selection. I thought that new AI technology could be the needed new solution.

Procedure

1. **Learn to code algorithms** through mentorship and online university courses
2. **Build a machine-learning (ML) algorithm** into which I can input wax testing data
3. **Build a large pool of useful and accurate data** through weekly wax tests at my local ski club
4. **Separate data** into two randomized pools to (a) train the algorithm, and (b) test its accuracy
5. Input test data to the newly created prototype and **test the predictive value** of the algorithm
6. **Refine the algorithm** with data collected by wax technicians across Canada

Results and Observations

Last year, I increased my ski glide by 7.29% by selecting higher-quality waxes matched to the current snow temperature. In Phase 2, I am also incorporating relative humidity, time since last snowfall, and snow type (including artificial or natural) to further refine wax selection.

Conclusion

An algorithm that efficiently and precisely predicts optimum wax for any given set of conditions would give Team Canada a competitive edge on the world stage, in time for the 2026 Olympics.

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