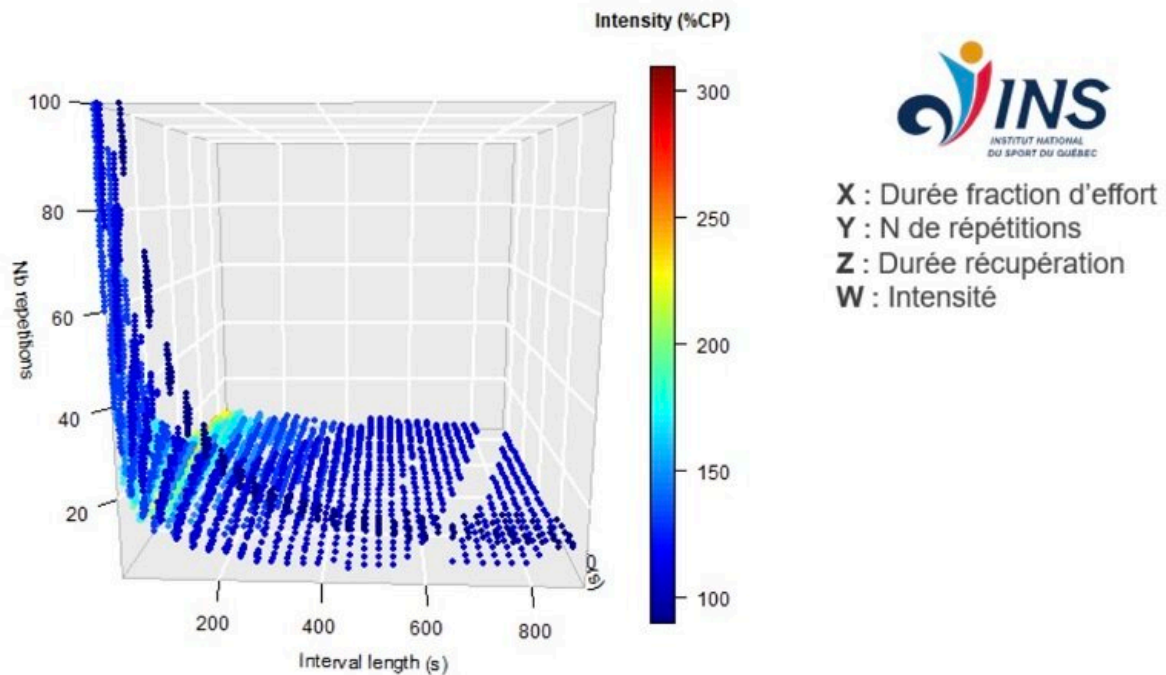# Using math to improve your workout

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Credit: University of Montreal

Interval training is the best way to improve your cardiorespiratory fitness and overall sports performance. It works for everyone, from the elite athlete preparing for the Olympics to the regular weekend athlete to the patient who wants to improve their physical condition.

There are many tools available to help kinesiologists, coaches and

athletes plan [interval training](#) sessions but none of them is ideal for juggling all the factors: the nature of the exercise, the number, duration and intensity of the low- and high-intensity intervals, the number of sets.

Guy Thibault, exercise physiologist and adjunct professor in the School of Kinesiology and Physical Activity Sciences (EKSAP) at the University of Montreal, wanted to do something about it.

Thibault recently retired as scientific director of the Institut national du sport du Québec (INS) and now devotes himself to developing a web application for interval training, his specialty.

He is excited about the project: "This is the culmination of a 35-year scientific career, the challenge of a lifetime," he said.

Multitalented team

Existing interval training apps use mathematical models—algorithms designed to balance the degree of difficulty of each session and provide a progression—but even the most popular ones can come up with sessions that are physically unfeasible.

"The models that are in vogue sometimes prescribe sessions in which the exerciser is supposed to do the first burst of activity at an intensity higher than their record, which obviously makes no sense," Thibault explained, pointing to a [computer simulation](#) he recently performed.

Thibault is working to develop a more powerful and user-friendly model in which the degree of difficulty could be controlled at all times, based on the exerciser's needs. To do it, he has teamed up with Jonathan Tremblay, physiologist and professor at EKSAP, and Jérémy Briand, a master's student in [exercise physiology](#) at UdeM, data scientist at the INS and Canadian triathlon champion.

Together, they have designed a rotating cube graphical model that incorporates all the parameters of an interval training session. The final algorithm will give users full control over the level of difficulty; no session will be too easy or too hard.

An app for everyone

While Thibault and his team's application may seem complex, it isn't intended for initiates alone. Anyone will be able to use it when it is released, currently scheduled for early 2023.

"Basically, we're designing the app with high-level athletes and their coaches in mind, but it will be easy to use," Thibault said. "You won't have to have a scientific background or understand the math to appreciate its features."

Therein lies Thibault's true motivation: to help people regardless of their level, and to explain the science of physical activity and sports in lay terms.

"At the end of the day, what makes me happiest in life is when someone tells me that because of my advice or methods, they or their athletes have improved," he said. "It almost brings a tear to my eye."

Provided by University of Montreal