


THE PERFECT RACE

How Father Time (age) and Mother Nature (wind) affect
sprint times of the world's fastest athletes

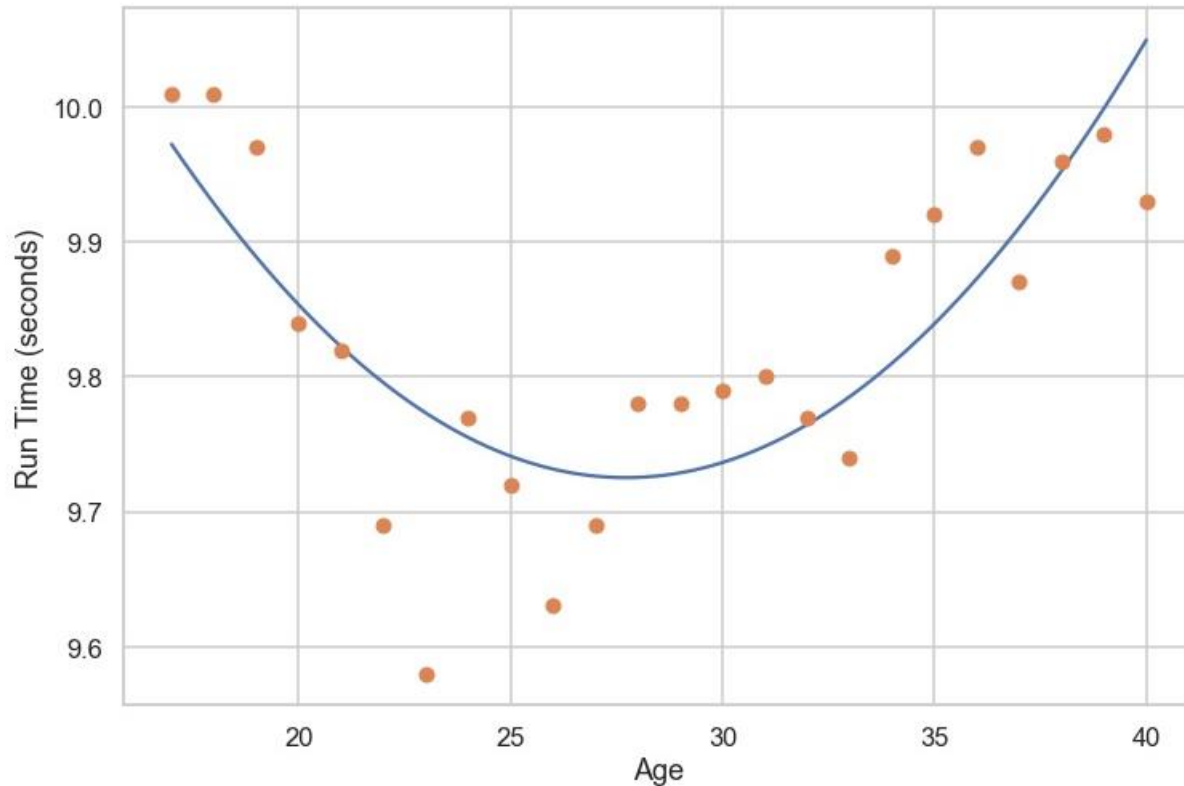
By Anesu Masube and Aaron Childress

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- ▶ **Age:** Analyze the impact of age on sprint times
 - ▶ **Wind:** Analyze the impact of headwind and tailwind on sprint times

OPTIMIZING FOR SPEED

DATA SOURCE: SCRAPED FROM ALL-TIME ATHLETICS

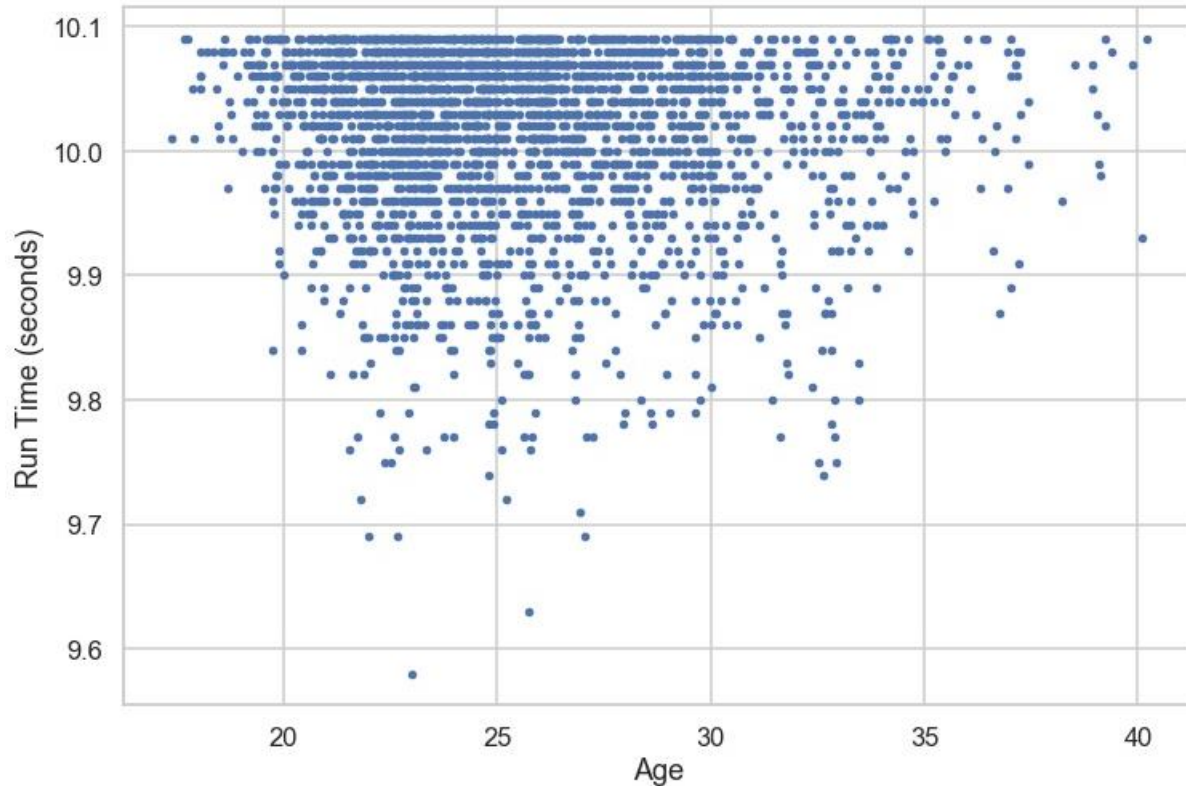
Fastest Men's 100m Sprint Times By Age



IS THERE AN OPTIMAL SPRINT AGE?

- ✓ Plotting fastest times run by age yielded a parabolic pattern.
- ✓ The minimum of the best-fit curve suggests an optimal age of 28.
- ✓ Therefore, we tested whether mean run times of ages 27-29 are lower than other ages.

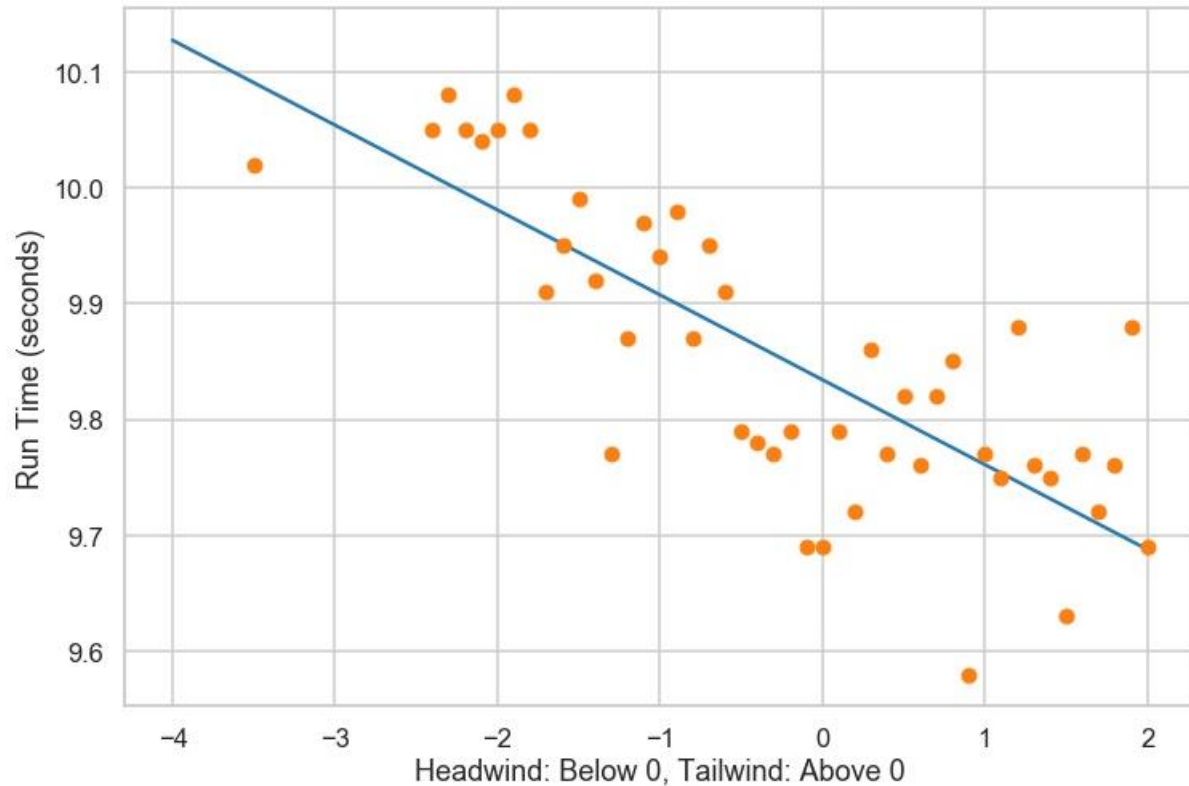
Men's 100m Sprint Times By Age



WE CAN'T SAY WITH 95% CONFIDENCE THAT AGE MATTERS

- ✓ While sprinters 27-29 put up low times, they also put up high times.
- ✓ Mean run time of 27-29 age group was lower than other ages, but there's a 20% chance there's no real difference.
- ✓ Therefore, we cannot say that age matters.

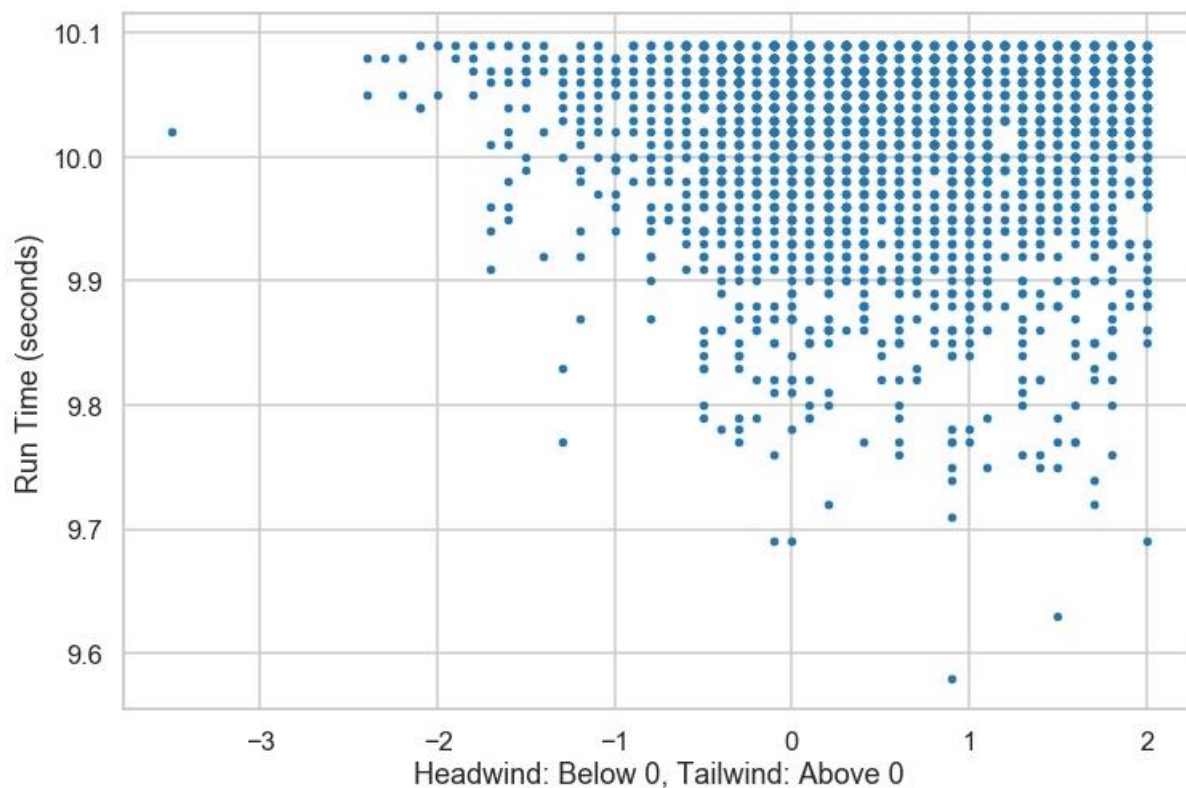
Fastest Men's 100m Sprint Times By Wind



DOES WIND IMPACT SPEED?

- ✓ Plotting fastest run times by windspeed yielded a linear pattern.
- ✓ The best-fit line suggests tailwind helps runners and headwind hurts runners.
- ✓ Therefore, we tested whether mean run times of tailwind races are lower than headwind races.

Men's 100m Sprint Times By Wind



WE CAN SAY WITH 95% CONFIDENCE THAT WIND MATTERS

- ✓ While higher times are recorded in all wind conditions, lower times are mainly recorded with tailwind.
- ✓ Mean run time of tailwind group was lower than headwind group, and there's only a 3% chance that means are really the same.
- ✓ Therefore, we can say the means are different.

AGE

- ▶ For the lowest times, there is a relationship between age and speed that indicates an optimal age for peak performance, but we could not confirm this for the entire sample.
- ▶ Get more data

WIND

- ▶ Every 1m/s change in wind speed correlates with 0.07s change in time.
- ▶ Indoor meets are preferred venue; headwinds can prevent new records.

RESULTS AND IMPLICATIONS

AGE

- ▶ Vary age test group range (e.g. 25-30 vs control)
- ▶ Look at frequencies of low times across age and time period categories (chi-squared test)
- ▶ Analyze times by runner at different ages

WIND

- ▶ Analyze times by runner under various wind conditions

OTHER

- ▶ Weather on race day

NEXT STEPS