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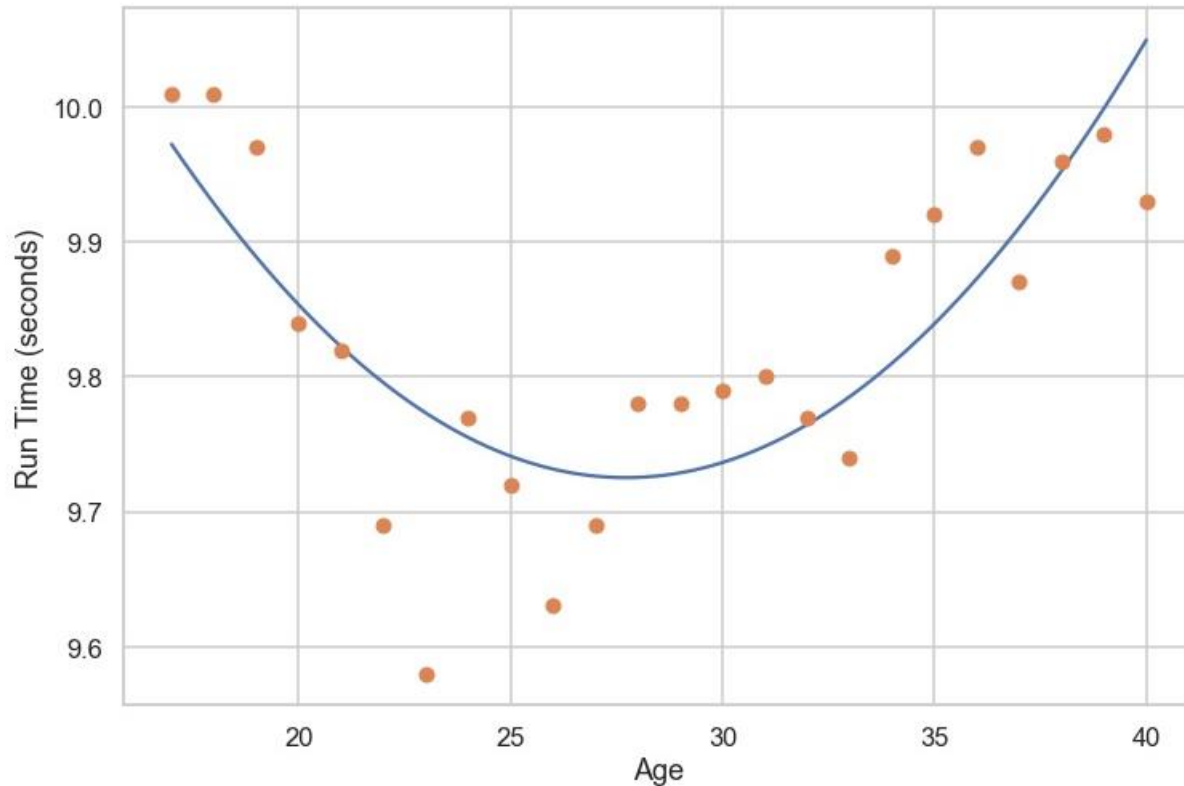
How Father Time (age) and Mother Nature (wind) affect sprint times of the world's fastest athletes

By Anesu Masube and Aaron Childress

- **Age:** Analyze the impact of age on sprint times

- **Wind:** Analyze the impact of headwind and tailwind on sprint times
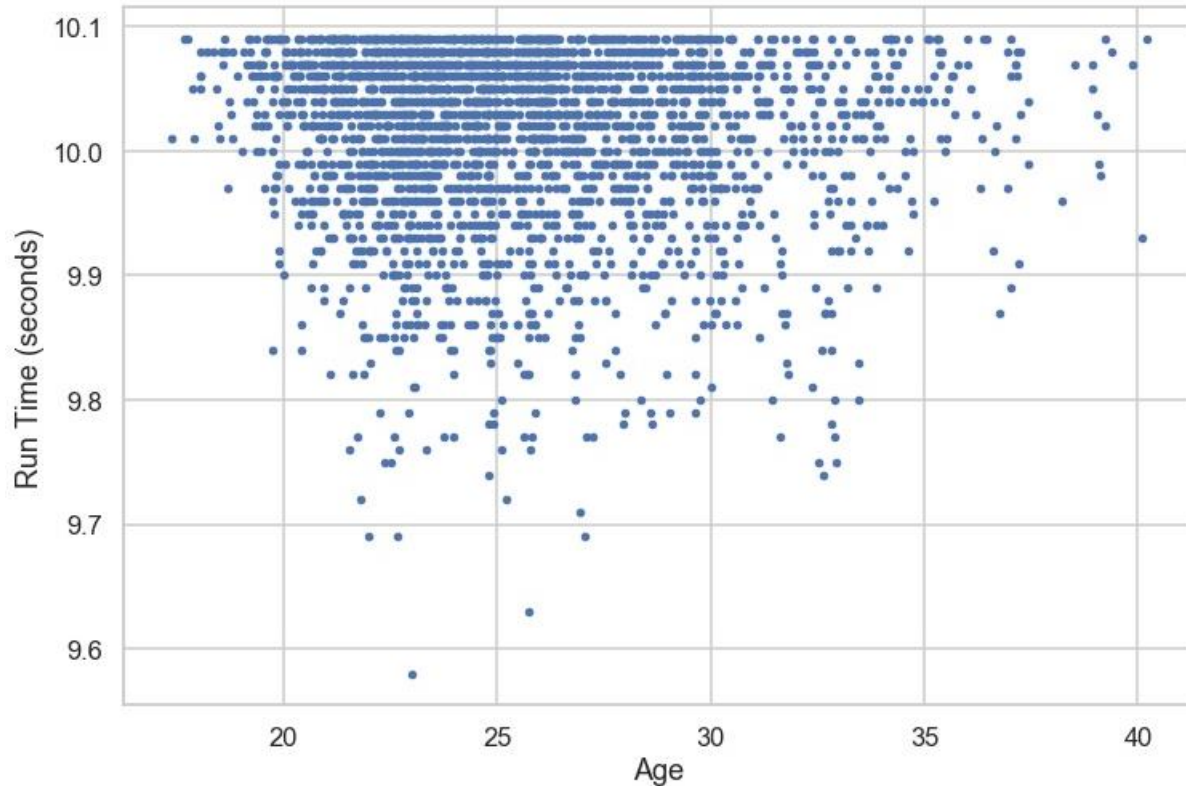
OPTIMIZING FOR SPEED

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.
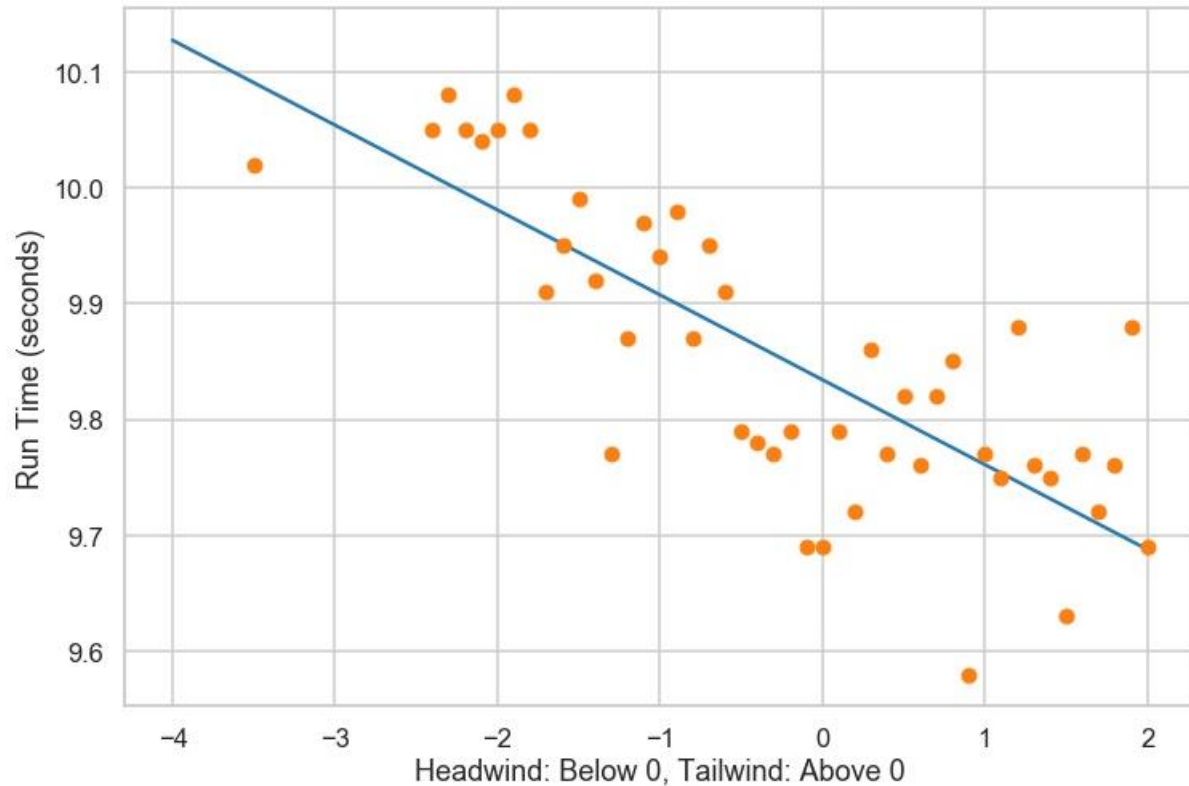
Men's 100m Sprint Times By Age

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
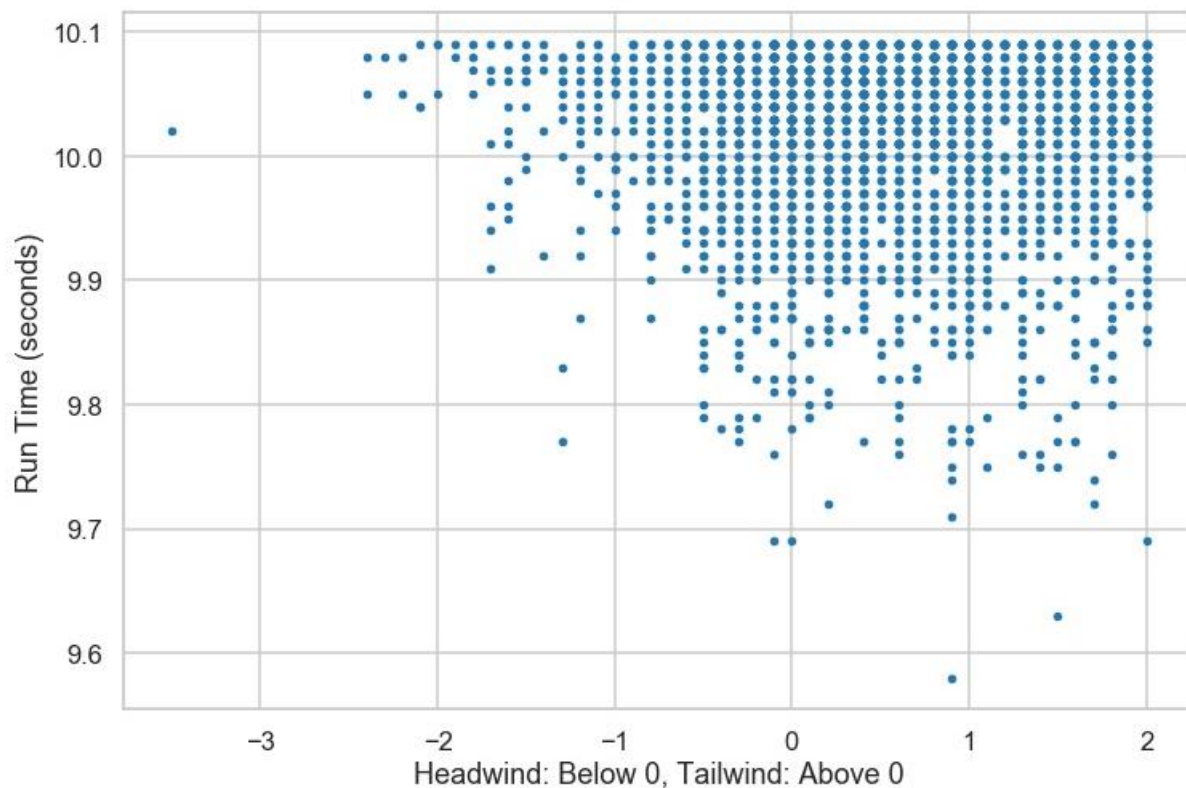
WE CAN SAY WITH 95% CONFIDENCE THAT WIND MATTERS

- ✓ 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