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Cliff 🦖 Jerrison

@pervocracy

...


one of the most amazing things the human brain can do is when you shake an opaque bottle and get an idea of how full it is by how the weight shifts. there's got to be incredible math going on under the hood there


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Tweet your reply

Reply





Xan, Cat cursed Bog Witch. @XandariathePink · 17h


...


Replying to @pervocracy


I can guess baking and cooking measurement fairly accurately, but previous generations didn't use measuring devices or recipes and the food came out amazing. That impresses me.


 3

 2

 281









Cliff 🦖 Jerrison @pervocracy · 17h


...


Replying to @XandariathePink


I almost never measure for cooking, but baking is so math-dependent it's pretty amazing. (Though I think *some* form of volume measurement has been possible for a long time, it just wasn't standardized. But you can still do ingredient ratios correctly with a handmade measure.)

 7

 1

 264





Show replies

blob:https://twitter.com/0d1e2931-7db1-4120-b203-61b959a6aa8c

1/21



Rhem should be studying @hickumu · 16h

...

Replying to @pervocracy

I'm constantly impressed by how much math and calculation the brain is doing in the background - judging distances while driving? Knowing where and when to move the hand to catch something thrown at you? Even computers can have trouble with that!



4



28



1,249



Cliff Jerrison @pervocracy · 16h

...

Replying to @hickumu

the worst thing is becoming aware of my human body while driving! thinking about how my hands and feet are moving is terrifying. gotta just think of myself as directly controlling the car with my brain.



14



10



914



Rhem should be studying @hickumu · 16h

...

Replying to @pervocracy

You are become car, respecer of speed limits.

But I feel you there, one of the most nervewracking things is when people are crossing a street or parking lot as I'm approaching, feeling confident that we're not on a collision course, and suddenly wondering why I'm so confident



1



190



Kevin got vaccinated @kevdaugrob · 14h

...

Replying to @hickumu and @pervocracy

It's really weird when you think of how our tools become extensions of ourselves.



2



102



Adam Abou-Nasr @Advntrbuddy01 · 4h

...

Replying to @kevdaugrob @hickumu and @pervocracy

I'm ruined enough after a decade with a smartphone. Think about the kids born with phones in their hands





Crystal Meh @LorettaManes · 10h

...

Replying to @pervocracy

Don't get me started on human speech.



3



75



Cliff Jerrison @pervocracy · 10h

...

Replying to @LorettaManes

That one really blows my mind. The movements and breath coordination are so complicated and--toddlers can do it, people can do it in their sleep or under sedation, people with dementia can do it even after they've lost almost all other motor skills--it's pretty amazing.



2



1



141



Crystal Meh @LorettaManes · 8h

...

Replying to @pervocracy

Yes! And, we have to take in others' speech, disassemble it, learn from it, then create a response.



1



9



Blomster Og Solskin @BlomsterSolskin · 4h

...

Replying to @LorettaManes and @pervocracy

And under poor conditions like noise, variety of dialects, individual different voices!



3



Some accounts you follow often like this Tweeter



alt text noticement increaser @natural_strap · 17h

...

Replying to @pervocracy

this is a plot point in Knives Out



2



61



third generation cat lady @trauma_kitty · 16h

...

Replying to @natural_strap and @pervocracy

Yes!! So good

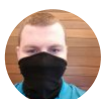


Avery! @AveryGTheWriter · 17h



Replying to @pervocracy

Sometimes Ill just throw something up in the air with my eyes closed and catch it and just marvel at the background processes to make it even possible



Jake @thatyetitude · 17h



Replying to @AveryGTheWriter and @pervocracy

Hell, proprioception (I think that's how it's spelled, don't quote me)

You can close your eyes, gave your hand flat extended out in front of you, bring it up and stop it just in front of your nose with your eyes closed

Tracking 2 separate objects, plus velocity, angle, etc

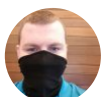


SoloJones @SoloJonesYT · 2h



Replying to @thatyetitude @AveryGTheWriter and @pervocracy

I hit my nose



Jake @thatyetitude · 1h



Replying to @SoloJonesYT

Might want to get that checked out 🤔🤔🤔



Quirky Wee Beasties @QuirkyWBeasties · 10h

Replying to @thatyetitude @AveryGTheWriter and @pervocracy

It's even a test of neurological accidents to bring your thumb to each of the fingers of your hand with your eyes closed. Most people can do it, unless something has gone wrong!





Xeans Iceman 🏳️‍🌈💛💜💖 @Xeans · 17h

...

Replying to @pervocracy

We're actually incredibly talented mathematicians, naturally. Calculus and a lot of very advanced branches of math are native parts of our thought processes, we just don't realize it - that's why teaching math is so hard, you have to learn to abstractly access an unspoken thought



5



21



484



Sarah 🏳️‍🌈💖💜💙 (she/they) @SarahEJoyal · 16h

...

Replying to @Xeans and @pervocracy

You're standing on the sand. There's something you want out in the water and some ways down the beach. Now of course walking on sand is easier than walking through the water, but walking all the way down until you can make a 90° turn towards the waves takes too long.



1



4



143



Sarah 🏳️‍🌈💖💜💙 (she/they) @SarahEJoyal · 16h

...

Replying to @SarahEJoyal @Xeans and @pervocracy

Now where's the most efficient point to turn off towards the water to reach your destination with minimum effort? Turns out our minds know it intuitively.



5



2



117



Cliff Jerrison 🦊 @pervocracy · 16h

...

Replying to @SarahEJoyal and @Xeans

I feel like I'd just walk down the sand until I was at about a 45 degree angle to the object, then turn? Not sure if I'm picturing the scenario right



3



12



third generation cat lady @trauma_kitty · 16h

...

Replying to @pervocracy @SarahEJoyal and @Xeans

It's usually a feeling thing, not a thing you can always predict. Which is why so many paved walkways have desire paths around them.



1



104





third generation cat lady @trauma_kitty · 15h

...

Replying to @trauma_kitty @pervocracy and 2 others

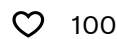
People thought about and planned those walkways and then the unconscious human brain was like “actually no thanks” 😂



1



1



100



Rory Hoffman @poodychulak · 7h

...

Replying to @trauma_kitty @pervocracy and 2 others

And they were right



11



Megan @MeganSantucci · 17h

...

Replying to @pervocracy

Closely related: the concept of proprioception lives in my head rent free.



3



6



404



Megan @MeganSantucci · 17h

...

Replying to @MeganSantucci and @pervocracy

My brain when I pick up a cup: isn't it so interesting that you can KNOW how much force to use when picking this up based on how full it is and almost never make a mistake??

Me: zomg I'm just trying to hydrate leave me alone



2



24



743



Boba Fartt @fullbleeed · 13h

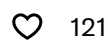
...

Replying to @MeganSantucci

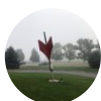
then you pick up a can that's closer to empty than you thought it was and you pick it up way too fast



1



121



Write Droid @zatachimaru · 13h

...

Replying to @fullbleeed and @MeganSantucci

A major technical obstacle for mechanical hands as a replacement for

human hands: Am I picking up a rock, a tomato, or an egg?



94



Fennec Who Is A Possum (Autumn Mode) @FennecWF · 17h



Replying to @pervocracy

We have a sort of natural intuition of how to do physics calculations in our head without having to know every minute detail. It's fascinating.



51



slut 4 papa xi @XiJinpingThot69 · 16h



Replying to @pervocracy

In fact there is no math at all going on under the hood there.



1



13



Northern crone @GillUpNorth · 13h



Replying to @XiJinpingThot69 and @pervocracy

Yeah, it's all experience and feedback loops.



6



Folgers @bestpartofwaki1 · 16h



Replying to @pervocracy

Velocity is distance over time and the bottle can only really have a fluid and a gas (I mean there can be multiple but you can't tell from the feeling so it gets simplified) so you'd be deriving the emptiness as distance the liquid travels at the speed you shake it



9



Gemini6lce @gemini6lce · 16h



Replying to @pervocracy

I'm sure the noise is vital



2



Genufa @petronia · 16h



Replying to @pervocracy and @whitneyarner

There's a lot of learning involved. I'm better at this now than I was in my teens

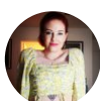


birdie @mydeardaroga · 15h



Replying to @pervocracy

my psychology teacher in high school pointed out what a complex task it is for our brain to use stairs and I've never stopped thinking about it



Hannah @Amber_mom_ · 13h



Replying to @mydeardaroga and @pervocracy

I can't see stairs the same way since the time I got high and barely got up the stairs because I was laughing so hard at the very concept. You're just, like, walking up in space? How is that a thing?

I was *really* high

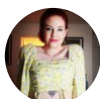


Jennifer 🏳️‍🌈 @yousirname1338 · 13h



Replying to @Amber_mom_ and @mydeardaroga

How many flights?



Hannah @Amber_mom_ · 13h



Replying to @yousirname1338 and @mydeardaroga

Only two, thank God



This Tweet includes a word you muted.

[View](#)



Knight of Hope @DexDavican · 14h

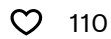




Replying to @DexDavican and @pervocracy
Basically feeling around for the ball feels like it's coming right at me", then engaging the "move hand to where I've moved it a thousand times before" protocol



3



110



This Tweet includes a word you muted.

[View](#)



ParodySaurav @TyrannoSaurav · 12h



Replying to @DexDavican and @pervocracy

Really funny to see what tasks are easy and hard in robotics. I think a large part of the problem is the focus on making scalable solutions, instead of solutions for just our bodies.



3



OafPilled @PilledOaf · 14h



Replying to @pervocracy

Everyone here thinking humans are just rapid fire doing calculus in their minds at all times is absolutely wild.

You learn how heavy a cup is by picking up a fuckton of cups in your life. Ever seen a toddler chuck shit around??



1



21



Cliff Jerrison @pervocracy · 14h



Replying to @PilledOaf

that's the point though, the toddler is learning how to do this kind of implicit calculation



2



140



OafPilled @PilledOaf · 14h



Replying to @pervocracy

There's no calculation. It's trial and error. You can't just call every little thing "math" lmao



3





The Pasquale Trolley @patricksaxton · 13h

...

Replying to @pervocracy and @revhowardarson

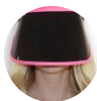
People will say "I'm bad at math" and then thrown you something



1



39



j ❄️ @silvergelpen · 13h

...

Replying to @pervocracy

My favorite kinds of super basic math like when there was to do was walk stare at the sun and measure to try and prove the earth round



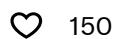
23



The Guillotine Implier @impliedChoppy · 13h

...

Replying to @pervocracy



150



Regular Ken @InterKen · 13h

...

Replying to @pervocracy and @scumbelievable

Hell, I don't know anything about this. But I do know that when we hear two notes being played at the same time, what we hear as consonant or dissonant harmony is actually our brains calculating the simplicity or the complexity of the ratios formed by their frequencies.



2



54

**Radical Rose**   @QuartsClock · 12h

Replying to @pervocracy

nah I'm cheating I have x-ray vision



5

**The Dax Symbiont**   @DaxKazon · 12h

Replying to @pervocracy

I feel like it's just a simple memory retrieval system bringing forth times you've done it before and approximating. Heuristic not algorithm



1



17

**The Dax Symbiont**   @DaxKazon · 12h

Replying to @DaxKazon and @pervocracy

Kinda like those computers that can be trained to recognize pictures of cake or whatever



2

**grayRanger** @grayRanger3 · 12h

Replying to @pervocracy

Might be why people with brain damage occasionally suddenly become really good at doing math in their head--the barrier between the subconscious intuitive calculations and the conscious mind is reduced because of the injury.



10

**darkeuphoria** @darkeuphoria4 · 11h

Replying to @pervocracy

Bet a crow could do this

**Daily Pedantry** @DailyPedantry · 11h

tik/

Replying to @pervocracy

Since ethanol has a lower surface tension, you can estimate the alcohol content of a spirit based on how bubbly it is after shaking it up.

The plasticity of our brains to build these sorts of models is amazing.

**Crungeoneer** @crungeoneer · 11h

...

Replying to @pervocracy

so much on-the-fly calculation just happening

imagine having to purposefully math out all the stuff you do just during a snack run to the fridge

**CathAguamía** @CathAguamia · 11h

...

Replying to @pervocracy and @dyddgu

Clearing the broad bean plants: I can tell by the weight of each pod in my hand whether it's worth opening to look for late ripeners. [#swmp](#) I'd call it in Cymraeg

**Dr. Phil Catdad** 🐱 🍷 @phil_ius · 11h

...

Replying to @pervocracy

The kinematics of solid, irregular objects is some of the hairiest math I've done in my life and yet people can accurately throw an axe without a problem. It's mind boggling

**Pete Alex Harris** 🐶 🚢 🚀 🤖 @ScavengerEthic · 11h

...

Replying to @pervocracy

So, using your arm as an inertial balance to weight the contents?

**Havin Somebeers** @32mbit · 11h

...

Replying to @pervocracy

We can also hear the the sounds of pouring hot or cold water and differentiate between them

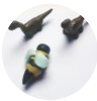
 1



 6







Quirky Wee Beasties @QuirkyWBeasties · 10h

...

Replying to @32mbit and @pervocracy
Whuuuuuut no!

Really??













Stag Do(e) @doeantlers · 8h

...

Replying to @pervocracy
when I'm high I like to close my eyes and toss a ball or rock or small fruit from hand to hand. seems like it shouldn't work, and yet I almost never let a lemon hit the floor





 1







Queerhawk 🏳️‍🌈 | 🇺🇦 | 🇬🇧 | 🇩🇪 | 🇫🇷 @alwaysadorecats · 8h

...

Replying to @pervocracy







 2







G is working on comics!?? @gpike_ · 8h

...

Replying to @pervocracy

Is it math (some of it is) or do our brains more just generalize based on past experiences? I don't think little kids can do this as well as adults can?

2



Alex Meredith @alexmeredit · 8h ...

Replying to @pervocracy
I like how while it's still cold you can see where the condensation ends on the outside and judge it that way

4



Tim Dutton @abearddyone · 8h ...

Replying to @pervocracy
Walking over uneven ground/flooring. Our feet are more powerful than our eyes

1



cellblock73 @cellblock73 · 8h ...

Replying to @pervocracy
Idk if it's math or experience in shaking opaque bottles.

1



"Parody" Turducken @the_magic_m · 8h ...

Replying to @pervocracy
Almost every sport is an overload of differential equations, the kind of stuff even die-hard mathematicians loathe.



semiotic overload @echoreflect · 8h ...

Replying to @pervocracy
a lot of different heuristics converging on an answer instead of like, a single math equation too

1



Julie Zwillink · 7h ...

**Julie Zwillen**

Replying to @pervocracy

It's impossible to see how much water is going from my fridge dispenser into an opaque water bottle. So I've taught myself to judge by sound

**Chekhov's Gunshow** @ChekhovsGunshow · 7h

Replying to @pervocracy

Same thing with judging the trajectory of a thrown/falling object. Just casually doing calculus, automatically.

**Michael Caldwell** @Absurdum14 · 7h

Replying to @pervocracy

The fun and useful one for me is, if you deal with jewellery all your life, you can basically tell if something is true metal or not by juggling it in your hand a few times, and matching the expected weight for that size to the weight you feel. Not 100%, but generally accurate 😊

**Sabrina the Synth ACAB she/it/they** @stm_system · 6h

Replying to @pervocracy

Yeah, on 1 hand it's impressive, on the other it makes it more infuriating that I somehow still had to spend years learning maths and can't do simple graph theory in my head.

**Friendly Neighborhood Dogwalker** @8x_Infinity · 6h

Replying to @pervocracy

I'm amazed with how we can hear both how full a container is getting while filling it, and the temperature of pouring water.

**'As You Know' Bob** @asyouknowBob · 6h

Replying to @pervocracy

picking something up, hefting it, and then accurately pitching it at a target

is equally remarkable,



1



2



jlindy 🦋 @jlindy77 · 3h



Replying to @asyouknowBob and @pervocracy

The timing involved in sequencing the throwing muscles (rotate hips, then rotate humerus, then extend elbow, then pronate, then fingers... all overlapping) to make an accurate throw are precise to thousandths of a second. Which is faster than nerve signals from brain to muscle.



2



3



Show replies



PaddingtonBearBSH 🙏💖🌈 and Lord Snow... @Paddingto... · 6h



Replying to @pervocracy

Also how full a glass is by the sound of the water as it fills it.



1



Very Hidden Ocelot @Mysisila · 6h

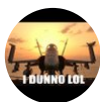


Replying to @pervocracy and @noop_noob

The brain is made to very accurately tell things by kinesthesia, if you throw a ball straight in the air and keep track of where it hits its peak, you can catch it from any position, even if it would be behind you.



2



Typically Parodic @eit_jjt · 5h

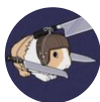


Replying to @pervocracy and @SophietheBear1

Merely standing on two feet is an extremely complicated feedback control system.



5



Re Reminder @rrmndr · 5h



Replying to @pervocracy

The auditory system is incredible. If you have even a little bit of musical training, you can learn to identify commercial airplanes by ear just by like... practicing

A: Boeing or Airbus?

B: Boeing 757, Rolls engines

A: That's super creepy

B: Yeah tell me about it!



1



6



Josue Hernandez @JoshHernandex · 4h



Replying to @pervocracy

I had a math teacher who talked about this all the time, they're favorite example was your brain calculating distance, speed, gravitational pull, arc angle etc.

during the simple act of catching a ball thrown at you



2



Vimala Hassan @naanthannaantha · 4h



Replying to @pervocracy

Ew gross



Barachiel @urbrobarachiel · 4h



Replying to @pervocracy

think about how ur cerebellum keeps ur balance and lets u move all automatically without you "thinking" about it- and has MORE neuron cells than the WHOLE rest of your brain! Now that's a lot of math in there.



3



Freedom Lancer  @freedom_lancer_ · 3h



Replying to @pervocracy

When I fell on my back I had a Sherlock Holmes moment of calculating point of impact and muscle tension to minimize damage





sunny @SunnyDaaaays · 3h

...

Replying to @pervocracy
Or by the sound of the water!



il{o @iko_x172 · 3h

...

Replying to @pervocracy
For me it's the sensation in my hands of the liquid as it hits the wall of the container that lets me translate that to an approximate visualization of the level of the surface of the contents



1



=● ^ ● = @404T2K · 3h

...

Replying to @iko_x172 and @pervocracy
You're a magician is what you are.



1



peach bellini @kafkarrest · 3h

...

Replying to @pervocracy
We literally spend the first two years of our lives doing this tho. It's just years of practice that you do remember



1



albahead the overtross @overtross · 2h

...

Replying to @pervocracy
i read once that things like catching a fly ball are less the product of specific calculations than, like, pattern recognition, so i'd expect some neurological shortcuts here too. that said, i think the thrust of what you're saying is true and fascinating



Sarah ✨ NerdyMind @NerdyMindNYC · 2h

...

Replying to @pervocracy
our brains are kinda neat 🧠😊





...

The brain is also calibrated to the density of water. In the lab, even if I KNOW that a clear, colorless liquid is chloroform and not water, when I pick it up, my brain still goes 'this is heavier than it should be' even though I am well aware that chloroform is much more dense.



1



...

If you ever listen to the shower, you can hear the moment the water goes from cold to hot.



2



1



Show replies



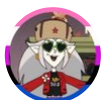
...

@frinferneepers



...

Ya know how you can just tell when watching tv or a movie if the prop coffee cup is full or not? You can just sense it's empty by how lackadaisical they treat the object? Always bothers me. At least pretend it holds liquid. COMMIT. That's that under the hood math right there.



...

human hands can detect textures that are *micrometres* wide if im not mistaken. wild.





Matt Barbot @BarbotRobot · 1h



Replying to @pervocracy and @DarthMarmalade

Did you know we can hear whether pouring water is hot or cold?



Peaches @j_d_long · 1h



Replying to @pervocracy

Me, every week when I do bar inventory and have to decide what percentage of the Frangelico bottle is remaining.



Jeff Bean @jwfbean · 52m



Replying to @pervocracy

Is it really math? Or is it guessing based on memory of past experience?



Tom R @beardedunixguy · 17h



Replying to @pervocracy and @NeolithicSheep

Nah, you're not doing that much math. Your bodymind doesn't compute to describe the world to itself. You're feeling the center of gravity change relative to your grip point

It's like saying that a gear is counting its revolutions. My clock isn't doing the math



Phony Stark @outworlder · 7h



Replying to @beardedunixguy @pervocracy and @NeolithicSheep

You have an arm extended and gripping the object. You are using the forces your muscles are applying across your entire arm to extrapolate the weight of the object(+centrs of mass). That's a craption of math.

A gear inside a clock can be viewed as part of an analog computer btw.



This Tweet includes a word you muted.

View



Jess Owen @authorjessowen · 3h

...

Replying to @Rechanmole and @pervocracy

Similarly, frogs catching flies with their tongues? 🐸

1

3

Show replies