

ADSA Data Science Community Newsletter

Data Science Community Newsletter features journalism, research papers and tools/software for May 19, 2022.

Please let us ([Micaela Parker](#), [Catherine Cramer](#), [Brad Stenger](#), [Laura Norén](#)) know if you have something to add to next week's newsletter. We are grateful for the generous financial support from the [Academic Data Science Alliance](#).

WHAT'S UP WITH STUDENT ENGAGEMENT?

In an [Op-Ed](#) for *The New York Times*, Professor **Jonathan Malesic** described this semester as one in which his students were often absent or "openly slept" in the classroom, turned in assignments late, and let discussion questions "hang unanswered." With naked disappointment he wrote, "They performed worse than any students I had encountered in two decades of teaching. They didn't even seem to be trying." Sic burn, prof.

Malesic is not the only instructor observing broadscale disengagement and withdrawal, yet we at the DSCN don't want to assume all students at all schools are putting in their worst performance ever. We have questions. So does **Andrew Campbell**, a computer science professor at **Dartmouth**, who [found](#) that students with more anxiety about COVID exhibited more mental health symptoms. Are students at institutions with more COVID precautions still in place more likely to be engaged, possibly because they never lost trust in authority figures to look out for their health? Or is it the other way around – those still being asked to report symptoms and wear masks are exhausted by the tedium of safety? Or is there no correlation between student engagement and COVID protocols because no matter where students live or go to school, the last couple years have been a hard time to come of age?

Please take our end of academic-year pulse poll: [What's up with student engagement?](#)

Featured Job

See the [ADSA Jobs Page](#) for more opportunities.



Data Science Facilitator I. University of Wisconsin-Madison, American Family Insurance Data Science Institute. Madison, WI (Some remote work possible).

ASTRONOMERS PHOTOGRAPHED A BLACK HOLE

Astronomers using the Event Horizon Telescope (EHT) **photographed the black hole** at the center of the Milky Way since we last appeared in your inbox. Though this may not seem like big news – maybe you vaguely feel like you've seen a black hole depicted before? – it is extremely difficult to *photograph* a black hole. A black hole has no matter; the photograph captures the halo outlining the nothingness. In the future, EHT astronomers and engineers will **create a movie** (more accurately: a moving image) of a black hole to better depict the dynamic swirling gasses around it.

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SUMMER WEBINAR SERIES

Hot Topics in Data Science

Register now go.ncsu.edu/HotTopics

WILDFIRE RISK MAPS, DE-RISK TECHNOLOGIES

First Street Foundation, a climate data start-up we **featured** earlier for the flood risk scores they produced for every property in the US, has released a **similar project [audio]** for wildfire risk. Want to know if your property is in an area that is at high risk of burning down? Our colleagues at **University of Colorado Boulder** and **University of California, Santa Cruz** are

probably saying "well, yes, but...". Use the new property **Risk Factor** to get a combined flood and fire profile for your property.

US wildfire risk TL;DR:

Wildfire risk blankets the south and west, where Americans have been moving for the past 60-70 years, setting us up for major upheaval in the real estate market and loss of net worth for families.

We also put First Street's flood risk and wildfire risk maps next to each other. Florida and Northern California, two of the most coveted real estate destinations, look like decidedly imprudent investments. Minnesota, on the other hand, looks OK. [See: Data Viz of the Week and its **flood map**.]

Technologies to de-risk catastrophic wildfires offer hope, but the advances and protections are not universal. Colorado benefits from the **region's defense-industrial research complex**, while Northern California academic researchers continue to **make progress on DamageMap**, open source machine learning software to predict neighborhood impacts likely to result from advancing wildfires. "Improving reactive management is unlikely to yield huge benefits," however, as **U.S. Forest Service** researcher **Mark Finney** **recently told** *Insurance Journal*. Not when the underlying problem is the copious quantity of vegetation as fuel. Oh, and climate change.

HOT MODEL PROBLEM IN CLIMATE SCIENCE

We move now from the consumer-facing, narrowly scoped climate science (e.g. tractable) problem of wildfire risk to the difficult modeling problem of projecting overall climate impacts into the future. Five climate scientists (including **Gavin Schmidt**, director of **NASA Goddard Institute for Space Studies** and co-founder of the *RealClimate* blog) explain why some of the most commonly used climate models are considered "**hot models**," predicting more warming, more quickly, than other models. Besides being unable to predict how much fossil fuel humans will release in the future – there is a great deal of flux and change in the energy markets – "we would still not know exactly how warm the planet would get. This is because human-caused global warming is an enormous experiment that has no precedent, and feedback processes, such as changes to cloud cover, will affect the pace and magnitude of warming." Of course, what these scientists are saying is true, but airing these kinds of scientific uncertainties and limitations publicly could have negative consequences for developing trust and collaborative climate action among the public. Doesn't mean that I would change a thing about the publication in this case – I wouldn't. But it is a reminder that climate science is frustratingly political, especially when it's unfolding publicly, in real time, riddled with uncertainty.

LOW-ENERGY AI USES MAGNETS FOR COMPUTE

Speaking of what AI researchers can do to mitigate the energy costs they're racking up by training and maintaining ML models, a team at **Imperial College London**, "produced the first proof that networks of nanomagnets can be used to perform AI-like processing...for 'time-series prediction.'" If **the approach** is able to scale, it could significantly reduce the morally questionable environmental trade-offs associated with scientific developments that rely on neural nets. Impressively, "nanomagnetic computing [is] up to 100,000 times more efficient than conventional computing."

AI-DEVELOPED ENZYME DEVOURS PLASTIC IN DAYS

In yet another promising AI-related environmental advancement, a new **enzyme** developed in conjunction with AI has shown it can devour plastic waste in days at room temperature. This is extremely important – plastic is destroying ocean ecosystems, threatening species (e.g. six pack rings strangling birds, plastic straws getting stuck up tortoises' noses). The goal is to

deploy the enzyme in polyethylene terephthalate (PET) plastic recycling facilities to return old PET back to its chemical building blocks which can then be turned into new PET.

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IS CHRIS BAIL THE ACADEMIC VERSION OF ELON MUSK??

Professor **Chris Bail**, head of **Duke University's** Polarization Lab is **asking** "why should we accept these [social media] platforms that were designed for kind of sophomoric purposes as the status quo, as the inevitable?" We like this guy already. Bail's lab has set up replicas of **Facebook** and **Twitter** so that the lab can run experiments such as testing what happens when people from different political backgrounds communicate with each other anonymously OR with real identities attached. Since the lab runs the platforms in a sandbox type setting, the lab can reconfigure features in a way that researchers who study the actual Facebook and Twitter platforms cannot. In some vague sense, then, Bail is kind of like the academic version of **Elon Musk**, building a *lab-based* Twitter for *research purposes* instead of buying the actual Twitter for funsies.

NEXT ITERATION OF MACARTHUR GENIUS GRANTS – HYPOTHESIS FUND

The next iteration of the **MacArthur Foundation** "genius" grants could be coming soon to...one of you? The **Hypothesis Fund** has identified 17 scientists and researchers known to be especially creative, innovative, lateral thinking types and deputized them to distribute \$300,000 to others. Not quite as big of a haul as a MacArthur, but who doesn't want to receive a wad of grant money without having to go through another onerous round of paperwork? In order to receive such a windfall, you'll have to have "an intriguing research idea so embryonic it has no chance of surviving traditional peer review." I would imagine that nearly every reader has such an idea, so the selection of winners could either turn into a kind of crowning-the-ascendant-visionary type of contest or devolve into a pool of intriguing misses. Either way, the awards reception should be the best combination of fancy + quirky + science.

BIDEN WARNS HIRING ALGORITHMS MAY VIOLATE ADA

President Biden has warned that hiring processes involving algorithms **may violate** the 1990 Americans with Disabilities Act (ADA) if applicants with disabilities are disadvantaged in the process. This is a novel, surprising, and probably effective legal mechanism to push back on AI and tech solutionism. Though it's still untested, there is a likelihood that people with disabilities are disadvantaged in these processes, so it does have teeth.

EXAM PROCTORING SOFTWARE IS EASILY FOOLED, LEAVES SECURITY VULNERABILITIES AFTER UNINSTALLATION

A new [arXiv](#) preprint lead-authored by [looked at](#) four remote proctoring software options and found that they could all be easily "fooled," rendering them not particularly good at preventing cheating. More importantly, even after users uninstall them, security vulnerabilities persist. These highly privileged proctoring programs need root-like access to camera, microphone, list of all apps running, keystrokes, and likely facial recognition. In the final tally, remote proctoring may be neither beneficial nor empowering for students.

BRAIN IMPLANT "STENTRODE" TO TREAT PARALYSIS IN CLINICAL TRIAL

A brain implantable "[stentrode](#)" that will deploy machine learning across electrical signals from brain waves enrolled its first paralysis patient in a clinical trial at **Mount Sinai Hospital**. The stentrode he received is "a minimally invasive electrode array similar to a stent that can record or stimulate the brain or nerves from within the blood vessels (endovascularly)."

SWEAT SENSORS MIGHT BE ABLE TO DETECT FLU, COVID-19

In a much less invasive approach further south at **University of Texas at Dallas**, a team of researchers [developed](#) a wearable strip that can detect two proteins associated with cytokine storms in everyday sweat (no workouts required). Cytokine storms are triggered by serious infections. The team is hoping to target flu and COVID-19, but there are still questions about whether all wearers would mount enough of an immune response to activate the sensor and if that cytokine storm would come soon enough for the wearer to take antivirals appropriately. The mechanism targets biomarkers for "interferon-gamma-inducible protein (IP-10) and tumor necrosis factor-related apoptosis-inducing ligand (TRAIL)." When these indicator proteins are elevated it's a sign of "a surge of pro-inflammatory immune proteins generated in the most serious infections." The breakthrough finding here is that these molecules are present in sweat at all, and that they can be detected by this sensor.

In completely unrelated wearables news, a [new meta analysis](#) covering 25 years of data from 1995 to 2017 – which covers the rise of wearable fitness trackers – found that adults in eight "developed" nations moved less and less over time. But because of the trackers, researchers were able to quantify the decline: "the decrease in physical activity per person was over 1,100 steps per day." I can't imagine work-from-home has improved that trend. Take a long walk today, readers.

BOSTON UNIVERSITY INCREASES TUITION BY 4.25%

Inflation has hit **BU** hard. President **Robert A. Brown** [announced](#) the largest tuition increase in 14 years. He noted that the tuition hike does not actually keep pace with inflation or allow the university to adjust faculty and staff pay rates to keep up, either.

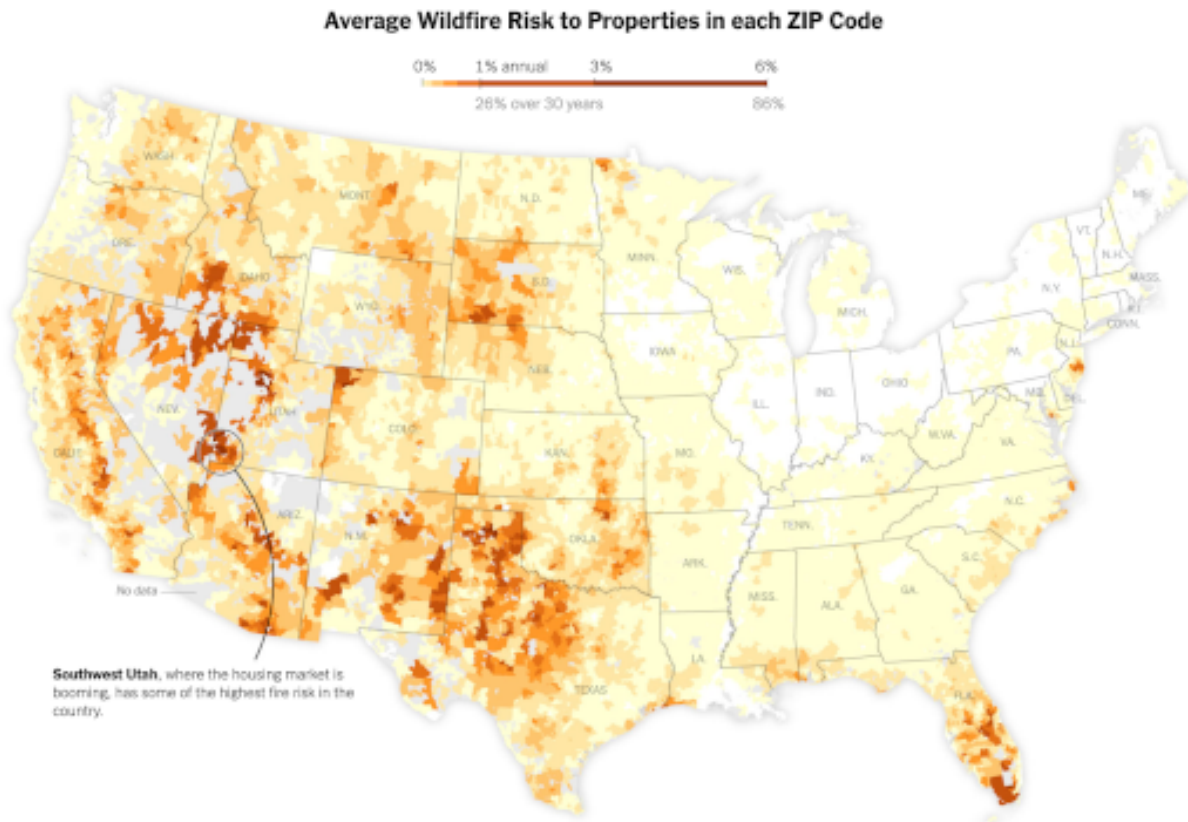
In another sign of the times, some colleges are now teaching students [how to become TikTok influencers](#). At \$5,000 in revenue per post, we are looking into it!

NEW PROGRAMS, FOLLOW THE MONEY

Click through to access [a structured spreadsheet](#) of New Programs and money moving around in academic data science.

DATA VISUALIZATION OF THE WEEK

Wildfire Risk Map by The New York Times, First Street Foundation, U.S. Census Bureau from May 16 2022



Deadlines

Studies/Surveys

The 'Becoming a Data Scientist' Jobs Survey is live!

"Are you currently working in a data science related job? Are you actively looking for a data science related job? Take the data science jobs survey & help us learn about the current state of things! "

RFPs

I hope to see more academics become part of this program [Twitter Developer Insiders]

"If you'd like to apply or nominate other power users of the #TwitterAPI, please fill this form and feel free to reach out to me if you have questions about the program!"

Tools & Resources

One of the core disconnects in computational creativity with machine learning (the latest instantiation being #dalle) is the emphasis on product instead of process

Twitter, Mark Riedl, Aaron Hertzmann from May 3, 2022

"My new position paper, coming to @iccc_conf, describes aspects of creative practice that are missing from most current formulations of artistic algorithms, and suggests some ways to model them. 1/"

The new baby name data is out!

Twitter, Martin Wattenberg from May 6, 2022

"Check out @NamerologyTalk to find out the latest trends. What alcoholic drink appeared as a name for the first time? Which famous robot is erasing a name? Which steamy series had the biggest effect?"

How Should you Protect your Machine Learning Models and IP?

Pete Warden from May 8, 2022

"The answers are complex and depend to some extent on your exact threat models, but if you want a summary of the advice I usually give it boils down to:"

"Treat your training data like you do your traditional source code."

"Treat your model files like compiled executables."

About Us: The Data Science Community Newsletter was founded in 2015 in the Moore-Sloan Data Science Environment at NYU's Center for Data Science. We continue to be supported by the Gordon and Betty Moore Foundation and the Alfred P. Sloan Foundation through the [Academic Data Science Alliance](#). Our archive of newsletters is at <https://academicdatascience.org/resources/newsletter>. Our mailing address is 1037 NE 65th St #316; Seattle, WA 98115.

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