

cornell

**animal
health**



hackathon

2022

college of veterinary medicine virtual event | feb 4-6

about the **hackathon**

A hackathon celebrates the use of minimal resources and maximum brain power to create outside-the-box solutions (“hacks”) in a constrained time frame.

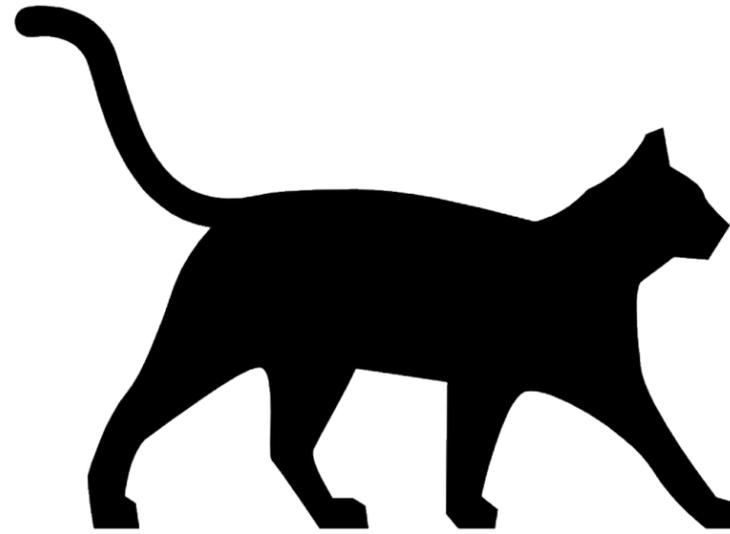
HACK + MARATHON = HACKATHON

The 2022 Cornell Animal Health Hackathon is an interdisciplinary event which brings together students from across degrees, majors, and schools at Cornell University! Teams comprised of veterinary, business, engineering, and design students, team to create solutions to needs in veterinary health care. On Saturday, mentors provide feedback and guidance to teams. On Sunday, the hackathon culminates in a project showcase to an audience of peers, mentors, and representatives.

It may be virtual, but we’re still including many of your favorite things: swag, food, mentors, and networking.

A panel of judges select winners and award \$9,000 to winning teams.

the challenges



CONQUERING THE CURBSIDE CARE MODEL

CHALLENGE SUBMITTED BY DR. TIM LOONAM, DIRECTOR OF UNIVERSITY RELATIONS ENCORE VET GROUP

Curbside veterinary care solutions - While veterinary services were considered essential during the pandemic, significant modifications to the traditional service model were necessary to ensure the safety of clients and staff. Most hospitals had to quickly develop protocols for curbside service, to limit potential viral transmission in waiting and exam rooms. In most cases, patient care happens in a treatment room in the absence of the pet owner. From the client's perspective, curbside service may provide some advantage, since most pets are more comfortable in their owner's car. Most veterinary practices are not optimized to provide curbside care and the resulting inefficiencies have created additional stress on practices already dealing with staffing shortages and burnout.

Can your  team design a congruent communication system designed to streamline things operationally (internal communication) and pet owner? This should incorporate everything from driving up and driving away.

MANAGEMENT TOOLS FOR SMALL HERDS/FLOCKS

CHALLENGE SUBMITTED BY DR. SABINE MANN, ASSISTANT PROFESSOR, AMBULATORY AND PRODUCTION MEDICINE, CORNELL UNIVERSITY

Many small farmers do not have a specialized commercial recordkeeping software to keep track of their food and fiber animals (goats, sheep, cattle, etc.). This produces a challenge to keep track of their food and fiber production animals' needs for regular immunizations, hoof trimming, or for recording of health events, withholding times following treatments and vaccines, births, deaths, and animals that are leaving the farm. This is particularly challenging when planning herd/flock health interventions together with the veterinarian, producing graphs of existing data, or reviewing historic data to improve herd/flock health.

Can you develop  most effective, adaptable recordkeeping system for small farmers to help them manage their herds/flocks more effectively?

CREATE A SECURE METHOD FOR STORING PATIENT DATA THAT CAN BE ACCESSED FROM ANY VETERINARY HOSPITAL OR "APPROVED" DATA ANALYTICS FIRM

CHALLENGE SUBMITTED BY IDEXX

Traditionally, patient medical records are stored locally at the hospital in which the patient visits their veterinarian. This creates challenges across patient care and data analytics, not to mention is environmentally unfriendly (fax is still a primary method of  record transfer). Patients that see multiple veterinarians (e.g. general practitioner and specialist) or need to visit the emergency room in the middle of the night, are at a disadvantage in that the ER or specialist may not have access to their records which can lead to misdiagnoses or possible drug interactions. Additionally, without extensive access to patient and hospital data, broad industry trends and insights are difficult to identify.

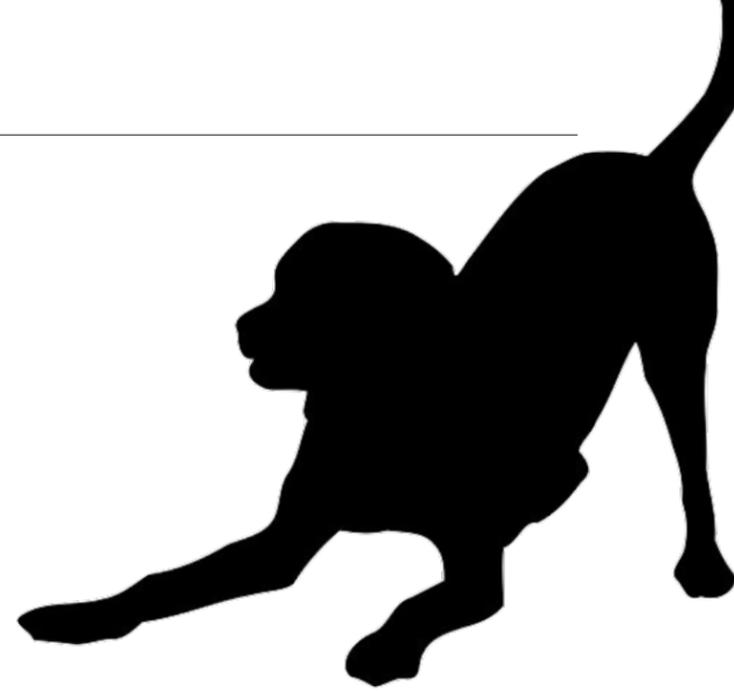
Can your team  a secure method for storing patient data that can be accessed from any veterinary hospital or "approved" data analytics firm?

VACCINE VEXATION

CHALLENGE SUBMITTED BY DR. JESSICA MCART, ASSISTANT PROFESSOR AMBULATORY AND PRODUCTION MEDICINE, CORNELL UNIVERSITY

Small and large farms, organic and conventional, dairy and beef, all vaccinate their cows to prevent disease. Vaccinations are often administered to large groups of animals at the same time for the sake of labor efficiency and reduction of animal stress, and a common method of administration involves the use of a repeat-dosing syringes to give the vaccine. When cows are being vaccinated in quick succession, needles used to administer vaccines are not always changed between animals. This increases the risk of transferring diseases between cows and affects injection site sterility and beef quality. The challenge is that no method exists that can be used to repeatedly administer vaccines throughout a group of cows while maintaining appropriate sterility and injection technique.

Can you develop  a device or solution that can be used to repeatedly administer vaccines throughout a group of cows while maintaining appropriate sterility and injection technique?



FROM DAIRY SIDE OF THE EQUATION

CHALLENGE SUBMITTED BY DR LINDA TIKOFSKY; PROF. SRVS. VETERINARIAN, DAIRY SPECIALIST BOEHRINGER-INGELHEIM

Background: A cow's production life is defined as a series of lactations, which are generally about a year long. Once she calves, she begins producing milk (the start of the lactation), and will continued to be milked until about 60 days before she is due to have her next calf. Ideally, this calf-to-calf cycle takes about a year. Sixty days prior to calving, she is 'dried off', which means we stop harvesting milk and allow her to have a period of rest before the next calf. These 'dry' cows are usually housed in a separate area or facility on the farm and fed separate rations.

At dry off, cows will generally be vaccinated and, depending on the farm or the history of the individual cow, receive an infusion of antibiotic into each quarter, followed by an inert bismuth based teat sealant. Cows that have had a mastitis event in the previous lactation or have a subclinical infection at dry-off usually receive antibiotic and teat sealant in each quarter; cows that have no history of mastitis and no evidence of a subclinical infection received only teat sealant.

Drying off a cow is a two-step process. She is milked a final time, teat ends are cleaned with an alcohol swab, and the antibiotic is infused, teat ends are then cleaned again and the teat sealant infused. Despite every attempt to make sure this is done in as hygienic a manner is possible, the reality is that there is risk of teat, hand or syringe contamination with manure and bacteria. Every time we cross a teat end with a syringe, we risk introducing bacteria and creating an iatrogenic infection. For cows that receive both an antibiotic and a teat sealant, we have to cross the teat end twice and so we double the risk.

Can you design a device that:

- Could deliver the antibiotic and teat sealant in series, thus eliminating crossing the teat end twice?
- Be able to be operated with one hand (since the other hand is restraining the teat for infusion)
- Be disposable, but not expensive (recyclable would be nice as well)

COMMUNITY ANIMAL SUPPORT: CARING FOR PETS BEFORE THE SHELTER

CHALLENGE SUBMITTED BY DR. MIKE GREENBERG, ASSOCIATE DIRECTOR OF PARTNERSHIPS BOEHRINGER-INGELHEIM

The world of animal sheltering has transformed significantly over the past decade with shelters taking on more than simply being locations to house animals and (hopefully) adopt them out. In the past, shelters began seeking lifesaving options only after animals entered their facilities. Now, they focus on what can be done to prevent animals from coming into the shelter at all. In short, shelters "animal resource centers" in their communities. They might help pet owners who need assistance with food, provide some forms of vet care, lend a hand to fix a broken fence, even give help with a pet deposit for an apartment. However, shelter management software wasn't built for these sorts of things ... Can you help?

The Problem: Shelter management software platforms tend to be built with the idea of intake in mind. Shelters who want to provide these "intake prevention" sorts of services do not have a good tool to manage all these cases; they resort to spreadsheets (or worse!)

Can you develop a software solution that will:

- Serve as a "case management solution" for animal shelters working to keep pets with their people, and/or in their neighborhoods.
- The key objects in the software would be...
 - Pets
 - People
 - Shelter personnel (I.e. "case managers")
 - Challenges being addressed
 - Resources being provided
 - Timeline of events and communication
- Solution would have the capability (through API's or the like) to potentially feed data to a shelter's current management platform.



FERAL CAT COUNT

CHALLENGE SUBMITTED BY DR. BRUCE KORNREICH, DIRECTOR OF THE FELINE HEALTH CENTER CORNELL UNIVERSITY

Use technology and engage the public in assessing and tracking feral cat populations - Feral cats are a considerable problem from both the veterinary medical and public health perspectives. Feral cats are at risk for a variety of health problems, and they can serve as vectors of zoonotic diseases and have significant ecological impacts on native avian, mammalian, and reptilian species. One obstacle in feral cat management is the lack of a reliable consensus estimate of feral cat populations, and of a means by which changes in this population can be tracked on a large scale in real time. Citizen science is a powerful tool that has been fostered by advances in consumer imaging (i.e. smart phone cameras), computing, and web-based interconnectedness.

Our challenge is to develop an app that, using proprietarily available digital imaging, artificial intelligence/machine learning, pattern recognition, real time tabulation of citizen-provided images, and a system to broadly disseminate data, can be used to quantify worldwide feral cat populations in real time.



HOUSETRAINING AID FOR DOGS

CHALLENGE SUBMITTED BY DR. DAVID LEE, EXECUTIVE DIRECTOR, CORNELL CANINE HEALTH CENTER CORNELL UNIVERSITY

Create an effective solution to house train dogs. House training a dog can be a very frustrating experience for an owner. Some breeds are especially difficult to house train and continue to be a challenge even as an adult. Owners may be less likely to adopt a rescue dog that has not been appropriately house trained as a puppy. The training process can be more complicated for working owners with irregular schedules and those who live in high-rise housing without easy access to the outdoors. House soiling can quickly test the patience of even the most committed owner and, if left unchecked, this behavior can cause significant damage at great expense. Many of these otherwise great companions will be surrendered to a shelter and face an uncertain future.



Can you develop an effective, practical way to detect and/or dissuade an otherwise healthy dog from relieving itself in the house?

REMOTE MONITORING AND INTERACTIVE TECHNOLOGIES FOR THE MANAGEMENT OF INAPPROPRIATE FELINE BEHAVIOR

CHALLENGE SUBMITTED BY DR. BRUCE KORNREICH, DIRECTOR OF THE FELINE HEALTH CENTER, CORNELL UNIVERSITY

Correct common cat behavior problems so they can be better housemates - Remote Monitoring and Interactive Technologies for the Management of Inappropriate Feline Behavior: Inappropriate behavior(soiling outside of the litter box, aggression, and destruction of property) is a common issue in feline husbandry. Studies and anecdotal evidence suggest that these behaviors can become rationales for relinquishment of cats to humane shelters. Successful intervention in inappropriate feline behaviors is expected to decrease the likelihood of relinquishment of cats to shelters. Monitoring of feline behavior and appropriate and timely intervention when these behaviors occur is vital to their appropriate management, and this monitoring can become difficult when owners are not present in the home.

Can your team design a congruent communication system designed to streamline things operationally (internal communication) and pet owner? This should incorporate everything from driving up and driving away.

PIGMENTED ANIMALS

CHALLENGE SUBMITTED BY THE CORNELL UNIVERSITY HOSPITAL FOR ANIMALS DENTISTRY AND ORAL SURGERY SPECIALISTS

Pigmented Animals: Our machines have a difficult time reading SpO₂ on animals with dark/black skin during sedation/anesthesia. I imagine this could also be an issue with human medicine as well. It is important to know oxygen saturation in our patients. Is there a way that we can read SpO₂ on animals with dark/black skin?

Suture and Pigmented Skin: Our Monocryl and many other suture materials are dark colored. This makes it difficult to check if there are any defects in the incision site or if this suture needs to be removed from animals with pigmented skin.

HEALTH HISTORY

CHALLENGE SUBMITTED BY JOBY COWULICH, LVT, CORNELL UNIVERSITY HOSPITALS FOR ANIMALS PHARMACY

It would be wonderful if there could be an app or something for pet owners to have that had the complete medical history including wellness and vaccines, diet, any health conditions including blood work and medication for their pets in case they are traveling and the pet needs emergency medical attention, or care. Or if the owner becomes incapacitated that would allow another clinic or caretaker to have access to the pet's medical history.

KEEPING PETS OUT OF THE SHELTER

CHALLENGE SUBMITTED BY DR. ROBIN MOYLE, VANE

Increasingly, one of the top reasons that pet owners relinquish their pets to animal shelters is the inability to afford needed veterinary care. How can we keep these families together by keeping their animals out of the shelter?

VETERINARY STAFF RECRUITMENT

CHALLENGE SUBMITTED BY DR. SHADI IREIFEJ, VETTRIAGE

There is a deficit of veterinary staff members across the board -- receptionists, assistants, technicians, managers, and doctors. Numerous companies, both veterinary and non-veterinary, are spending numerous resources to solve this complex multifaceted problem. Despite their best efforts, no one has solved this problem for good. Can you?

SPECIALTY CASE BACKLOG

CHALLENGE SUBMITTED BY DR. MEG THOMPSON, ASSOCIATE DEAN AND DIRECTOR OF THE CORNELL UNIVERSITY HOSPITAL FOR ANIMALS

Increase in small animal specialty and emergency caseload has overwhelmed all systems. Solutions across the nation are the same, with the similar descriptions and unresolved backlog. What new service model could overcome the current challenge?

SILENT CORDLESS CLIPPERS

CHALLENGE SUBMITTED BY DANA URSU, LVT, THE CORNELL UNIVERSITY EQUINE HOSPITAL

Increase in small animal specialty and emergency caseload has overwhelmed all systems. Solutions across the nation are the same, with the similar descriptions and unresolved backlog. What new service model could overcome the current challenge?

SHORTAGES IN THE VETERINARY PROFESSION

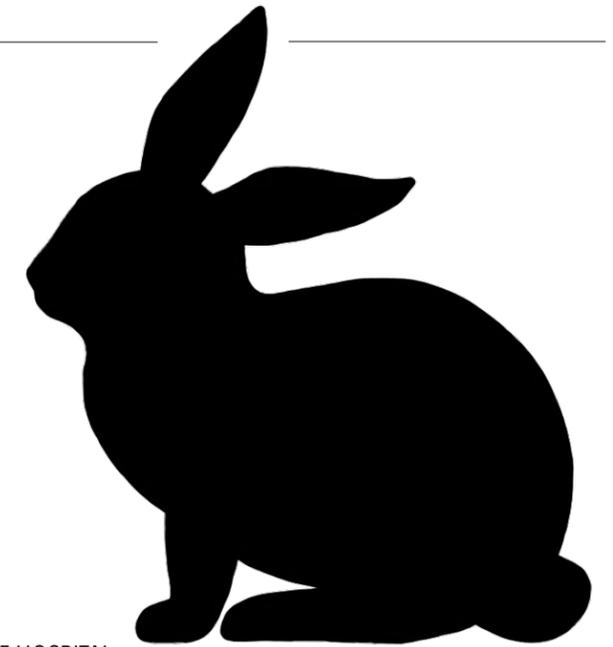
CHALLENGE SUBMITTED BY DR. ROBIN MOYLE, VANE

The veterinary profession is currently facing an unprecedented shortage of doctors and support staff. Many communities have become veterinary deserts with the nearest veterinarian hundreds of miles away. How do we find new and unique ways to provide access to care?

HIGH THROUGHPUT AUTOMATED MICROSCOPIC AGGLUTINATION TEST

CHALLENGE SUBMITTED BY JOEE DENIS, POPULATION MEDICINE AND DIAGNOSTIC SCIENCES, CORNELL COLLEGE OF VETERINARY MEDICINE

Leptospirosis is a bacterial disease with a wide range of hosts including common companion animals, livestock, and humans. The effects of leptospirosis can vary. For example, infection in dairy cattle results in infertility and abortion; thus, frequent diagnostic testing is necessary to maintain dairy herd health. The diagnostic test used to diagnose Leptospirosis is a serological reference test known as the microscopic agglutination test (MAT). A MAT requires mixing dilutions of serum with live *Leptospira* serovars. The presence of antibodies is indicated by the agglutination of the *Leptospira*, which is assessed via microscopy. The titer is determined by the highest dilution of serum that results in 50% agglutination. The manual set-up and interpretation of the MAT is a laborious, low throughput procedure with long turnaround times and requires skilled personnel to perform the test. Can you develop a solution that would allow for rapid consistent high-volume testing of Leptospirosis?



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KOALAFICATED

BEST VETERINARY HEALTH SOLUTION | \$3000

A non-invasive alternative to modern artificial insemination using soft robotics

Daeden Gordon-Somers-Archer BS '24 | Zachary Suarez BS '24 | Harry Samuels BS '24 | Maya Kulikowski BS '24 | Erik Bielski BS '24

SEAL THE DEAL

MOST INNOVATIVE | \$3000

A device that can deliver both antibiotics and teat sealant without removing the needle in the teat.

Daeden Gordon-Somers-Archer BS '24 | Zachary Suarez BS '24 | Harry Samuels BS '24 | Maya Kulikowski BS '24 | Erik Bielski BS '24

VERY GOOD TEAM

BEST MARKET READY SOLUTION | \$3000

"No Scratch Meow" monitors and modifies cat scratching behavior even when you're not home!

Nathan Zirkiev BS '22 | James Duong MBA '23 | Lauren Harper DVM '25 | Ari Padda MBA '22

SILENT BLADE

Cordless grooming clipper featuring SILENTEK* noise and vibration-dampening technology.

Taylor Morgan PHD '25 | Juliane Tsai BS '22 | Taylor Overton BS '22 | Neil Gogri MENG '22 | Martina Morris DVM '23

AEROJECT

A pneumatic injection system to revolutionize cattle vaccination: Sterile, quick, and safe for humans and animals.

Max Li BA '23 | Christian Rice BS '22 | Rachel Herschman BS '22 | Ivanka Juran DVM '24

BEARISTAS

App targeting pet owners to monitor stages of growth of pets / be informed on healthy development

Joseph Shawn MBA '22 | Maxwell Pang BS '25 | Will Zhang BA '25 | Larrisa Chen BS '24 | Caroline Whittaker DVM '25 | Sohela Dhillon DVM '25

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BRAINI HACKS

Meet CATch! An app that revolutionizes the way we'll track feral cat colonies through citizen science, AI, and GPS.

Alicia Gomziakova vaz Ferreira MBA '22 | Jenna Rudolfsky DVM '23 | Joseph Tate BA '23 | Yashshree Shah BS '23 | Techee, CS | Sam Karia MBA '22

CAPITAL VAX

Needle cap that will sterilize the needle between uses for Cattle Vaccination.

Christopher Doyle MBA '22 | Cyril Le Doucen MBA '22 | Kayla Fox MBA '22 | Sebastian Rodriguez Goumachwili MBA '22 | Sophie Strome DVM '23 | Hannah Mittman DVM '24

FANTASTIC FOUR

Create a sustainable saved supplement for cattle feed that significantly reduces methane production.

Timothy Toto MBA '22 | Nachiket Kulkarni MENG '22 | Ravipratap Misra MENG '22 | Slav Prohasky MBA '22 | Nathan Laurenz BS '22 | Nathaniel Essigs MPS '22

GJMSTRY

Automated training system comprised of smart collar and phone application pairing to remotely correct your pet cat's behavior.

Mark DeGaetano MBA '22 | Fiahan Xie BS '23 | Gary Wang MENG '22 | Yu Pan MENG '22 | Tianlun Zha MENG '22 | Sonja Meberg DVM '24

INHALERS

A new, stationary inhaler device for cats with asthma to deliver Corticosteroids with a food reward to minimize stress and issues.

Bryan Malecky MB '22, Martin Frugone MBA '22, Shemar Christian MENG '22, Jeffrey Trinh MBA '22, Monali Faldu DVM '24

P(I)KSEL

A device that uses ELISA testing to detect Leptospirosis in cattle.

Emily D'Angelo BS '25 | Peyton Lancaster BA '25 | Sam Danchak BS '25 | Lyndsey Wright BS '25

VET SPACE

Creating an intimate network for working professionals in the vet space to foster collaboration for overall.

Zhuoxing Li DVM '23 | Hari Tripuraneni MBA '22 | Aditya Ravi MENG '22 | Aditya Bhamidipati MENG '22

PETSSPORT

Streamline pet travel documentation process for pet owners and vets.

Waqar Ali MBA '22 | Yifan Wu MBA '22 | Frank Kim PHD '24 | Dongmin Lim MPS '22 | Ana Griefen DVM '23

PUPPY POSTOP

Improve post-operative small pet care by connecting pet owners and veterinarians via a third-party application.

Karen Sulekh MENG '22 | Shannon Keane MBA '22 | Christian Castilla MBA '22 | Ally Butler DVM '24 | Chelsea Churchill DVM '23 | Elizabeth St. Clair DVM '24

SOMETHING'S FISHY

Real-time water quality monitoring system that provides an alert system and interpretation of water quality parameters to save pet fish lives.

Julia Boza PHD '24 | Timothy Bail MBA '22 | Tanaya Yadav MENG '22 | Michelle Greenfield DVM '23

SURVIS

Enables real-time information sharing between vets and gov. agencies, reducing the scale of outbreaks, economic losses and lives lost.

Minerva Panda MS '23 | David Singler '24 | Rashmi Sinha MS '22 | Richa Vishwakarma | Saurav Panda

THERAMED GLOVES

Sterile/non-sterile gloves for use by ambulatory vet practitioners & handlers that work with animals in the field under harsh weather conditions.

Shenghao Tan PHD '27 | Aniruddha Saha PHD '26 | Beto Duron MBA '23 | Manuel Escobedo MBA '23 | Mariacami

VENIGMA

Provides 24/7 real-time vitals & warnings to busy pet parents.

Namratha Sathish MPS '22 | Jiayun Yu MBA '22 | Rahul Jain MENG '22 | Yajing Wang MENG '22 | John Montani MBA '22 | Nardine Nasr DVM '24

VMCVM

Cloud database that can help streamline animal information among vets, pet owners, and shelters

Sydney Boo DVM '25 | Ella Rak DVM '23 | Siddharth Patel MBA '22 | Michael Deeter MBA '22 | Jesse Kohlen MBA '22 | Risitha Thambireddy MENG '22

STYZ

An app to collect feral cats' data from community residents, use AI for recognition, and model disease transmission with network structures.

Shenni Liang BS '24 | Yijia Dai BS '24 | Yijun Yin BE '24 | Ziqi Yuan BS '24

TEAM-JAM

Animal nutrition, exercise and tracking.

Raghav Nath MBA '22 | Kaylee Lee MS '23 | Jonathan Schroeder MBA '22

ONE SIDED COIN

An accurate triangulation System for Cows in a field to help rescue cows that are having strokes.

Ali Taha BS '23 | Grace Yao BS '23 | Justin Tan BS '23 | Nalu Concepcion BS '22 | Cole DeMeulemeester BS '22

it's a
group effort

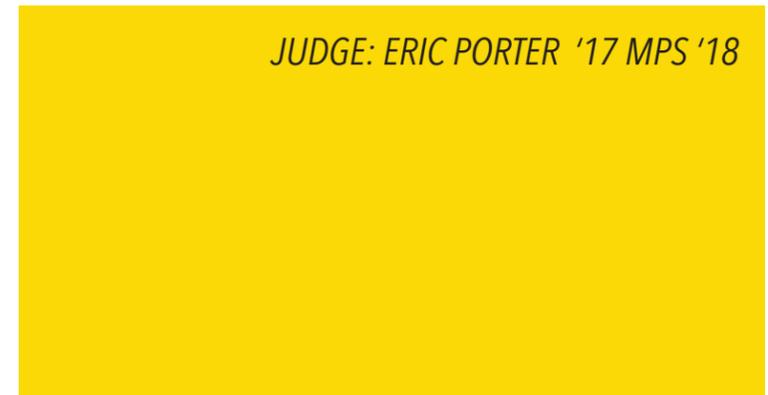
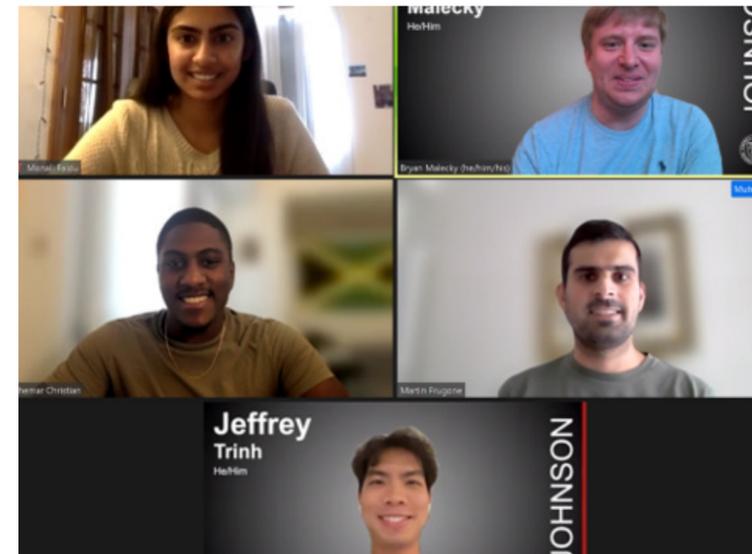


JUDGE: SHADI IREIFEJ DVM, '06, DACVS

TEAM "INHALERS"



JUDGE: ERIC PORTER '17 MPS '18

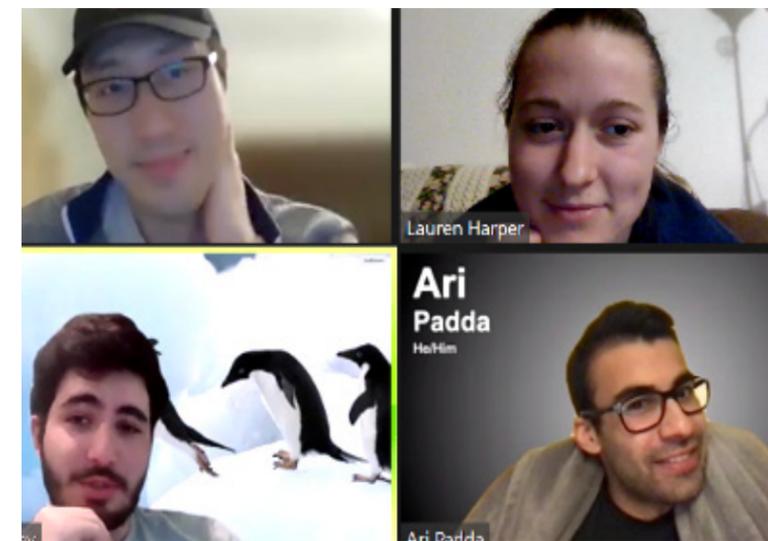


TEAM "VMCVM"



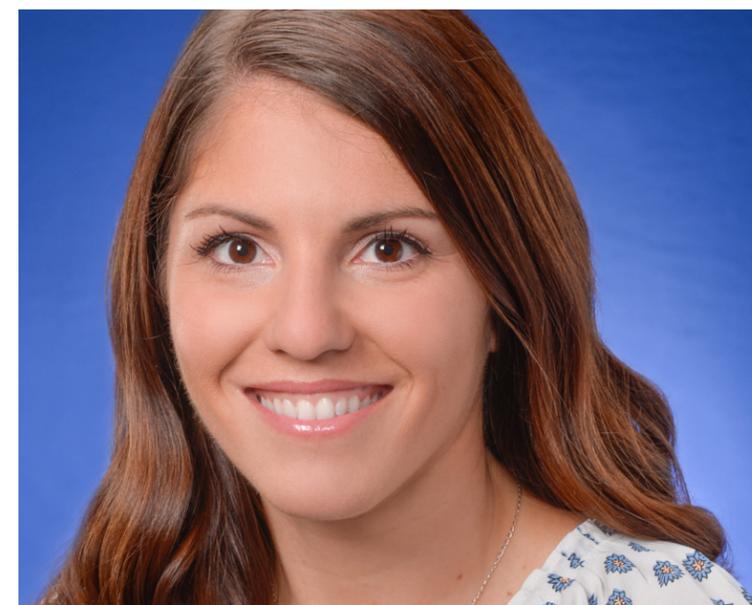
MENTOR: MATHIEU GLASSMAN MBA, VMD, DACVS

MENTOR: KIM BENCIVENGA DVM



TEAM "SEAL THE DEAL"

KEYNOTE SPEAKER & MENTOR: ERIN CHU '10,
DVM '14, PHD '17



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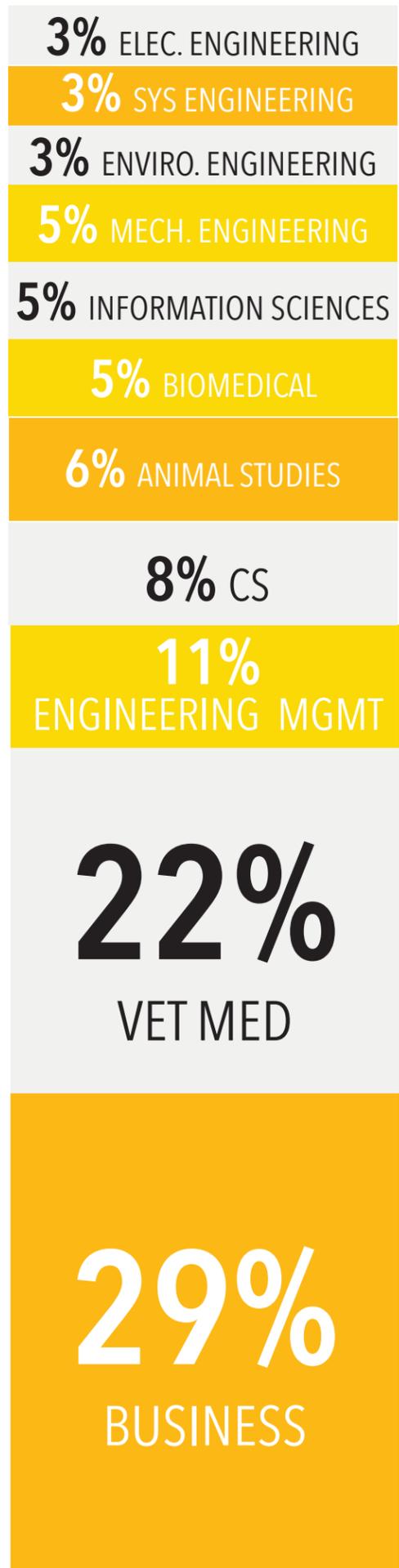


key statistics

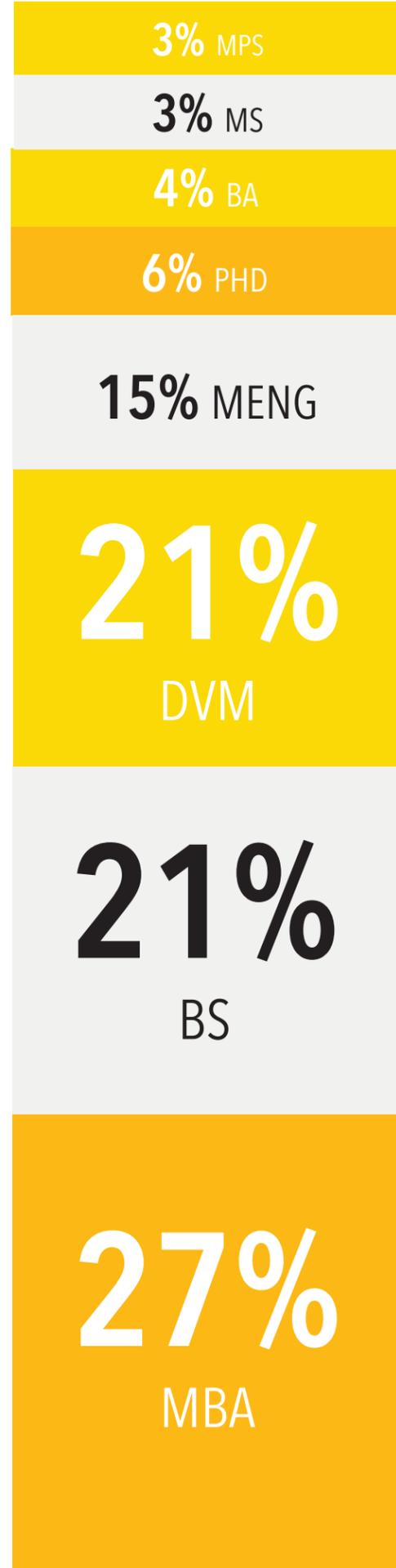
COLLEGE



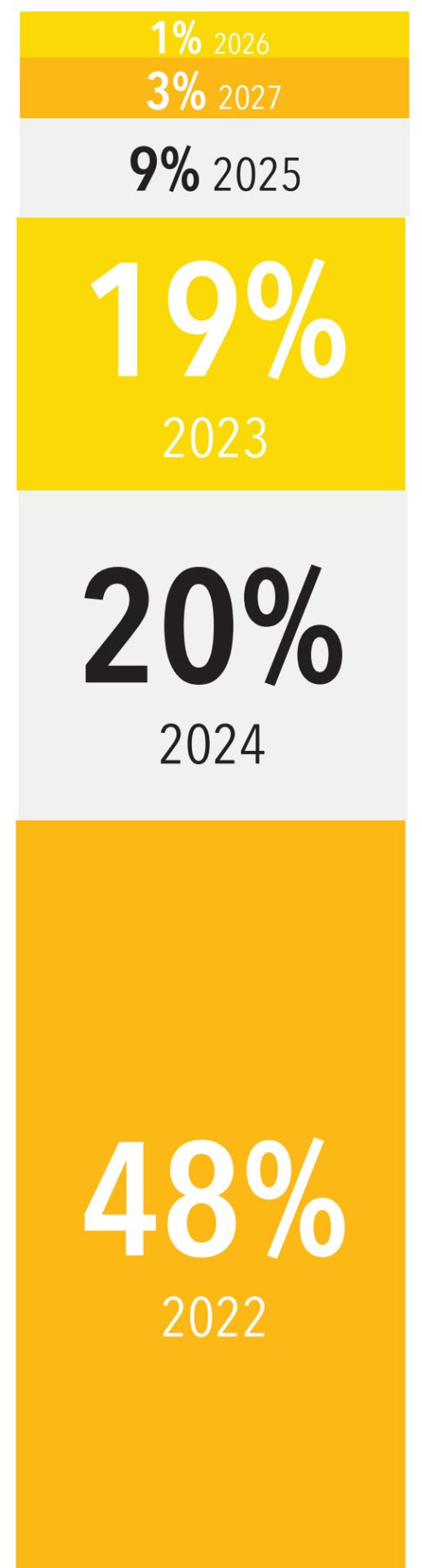
MAJOR



DEGREE



GRADUATION YEAR





THANK YOU SO MUCH FOR A GREAT WEEKEND. I REALLY LOVE THIS EVENT AND HAD BEEN LOOKING FORWARD TO IT ALL YEAR!

- SOPHIE STROME DVM STUDENT VIRGINIA TECH

ON BEHALF OF BOEHRINGER-INGELHEIM ANIMAL HEALTH, CONGRATULATIONS TO YOU AND YOUR TEAM FOR YET ANOTHER GREAT ANIMAL HACKATHON AT CORNELL! #6! DESPITE THE SWITCH TO A VIRTUAL PLATFORM, THE STUDENTS AND THEIR RESPECTIVE 'HACKING' GROUPS REMAINED AGILE, THRIVED, AND CREATED SOME VERY NICE FINAL PROJECTS & PRESENTATIONS!

- ANDY ESCHNER '87, DVM '90 JUDGE & SPONSOR

THIS WAS MY FIRST CORNELL HACKATHON ENCOUNTER AND IT WAS REALLY IMPRESSIVE! I ONLY CAN IMAGINE HOW THIS WOULD HAVE PLAYED OUT UNDER NON- PANDEMIC CIRCUMSTANCES.

- CHRISTIAN EPE DVM, MENTOR

THE HACKATHON ... HAS OPENED MY EYES TO THE PLETHORA OF WAYS THAT I CAN ENRICH MY CAREER PATH. SPECIFICALLY, I CAN NOW COMPREHEND JUST HOW VALUABLE COMMUNICATING WITH INDIVIDUALS OUTSIDE OF MY ACADEMIC INTERESTS IS.

- ANONYMOUS FROM STUDENT FEEDBACK SURVEY

KUDOS TO TEAM CORNELL FOR A ANOTHER AMAZING HACKATHON EXPERIENCE! THE IDEAS THE HACKERS CAME UP WITH WERE INNOVATIVE, RELEVANT AND CAN DEFINITELY HELP IMPROVE THE FUTURE OF VETERINARY MEDICINE.

- TINA SUNG, SPONSOR

I LEARNED SO MUCH IN 24 HOURS, EVERYONE SHOULD EXPERIENCE AT LEAST ONE HACKATHON AT THEIR TIME AT CORNELL. I AM GOING TO SELL THIS HARD TO ALL MY FRIENDS :)

- ANONYMOUS FROM STUDENT FEEDBACK SURVEY

