
EUREKA
APR.
2021
SNAIL MAIL

To:

WELCOME TO AI APRIL!
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An Interview with

MEGAN MCDANIELS

Wildlife Biologist

HI MEGAN, INTRODUCE YOURSELF!

Hi there! I am a wildlife biologist and nature-lover who is passionate about using technology and partnerships with communities to accelerate the conservation of endangered and threatened animals while also helping the people who live around them. I have studied many species on land and in water, from African elephants to oysters. I enjoy volunteering with youth education programs to inspire others to use their unique skills and interests to help protect our planet. I currently work for a conservation technology nonprofit called Wild Me.

YOU HAVE A REALLY INTERESTING JOB, CAN YOU SHARE WHAT YOU DO WITH OUR SNAIL MAIL READERS?

As a biologist, I work to understand how animals interact with each other and their environments, especially when dealing with climate change and habitat loss. To do this, I study animals in the field and also use many tools like statistical analysis programs, GIS mapping, app development, camera traps, GPS collars, genetic sampling, and artificial intelligence. Another important part of my job is communicating what I learn with others. I do this by writing articles and papers about research discoveries and how they can be used to help wildlife and people. I also use social media to share videos, photographs, and illustrations that make learning about conservation fun!

WOW! HOW CLOSELY DO YOU WORK WITH COMPUTERS AND ARTIFICIAL INTELLIGENCE ON A DAILY BASIS?

When I'm not in the field studying wildlife, I spend several hours a day using my computer to process and analyze the data that myself and other scientists have collected. This means turning the pictures and notes we've taken in the field, as well as observations collected by citizen scientists, into numbers on the computer that will eventually tell the stories of how animals are behaving and how healthy their populations are. Artificial intelligence has been immensely helpful in speeding up this process.

WHAT DOES YOUR AI DO, EXACTLY?

Photographs of animals hold lots of valuable information about what they do, where they move, and how many of them there are. Just like people, every individual animal is unique. Some animals, like zebras and whale sharks, have obvious patterns that set each individual apart. Other animals, such as lions or porpoises, have less obvious differences. Our artificial intelligence platform called Wildbook uses algorithms to tell us what types of animals are in a photo and which unique individual they are. The algorithms use an animal's markings, like its stripes or spots, scars, the shape of its tail or ears, and size, to determine who they are -kind of like how some phones are able to unlock by recognizing your face. Wildbook can also track individual animals by using their unique genetic markings and the sounds that they make.

HOW DIFFICULT WOULD IT BE FOR A PERSON TO DO THIS AI'S JOB?

It's possible for a person to do this work, but it would take a very long time and there could be many mistakes. Thousands of species of wild animals are declining and face extinction, and there is no time to waste when it comes to saving them. Technology like artificial intelligence is helping us make faster and smarter conservation decisions.

DOES THE AI NAME THE ANIMALS IT KEEPS TRACK OF? DO YOU?

Each animal's name depends on its species and the names used by the scientists who study them. For example, Grevy's zebra from Kenya may receive a numeric ID, like the male labelled 10059, while some marine biologists studying humpback whales in Iceland prefer to get creative with names like "Fluke Skywalker" and "Whaliam Shakespeare". Other researchers will use a combination of alpha-numeric IDs and fun nicknames. The AI is able to remember and store all of these names.

DO YOU HAVE A FAVOURITE ANIMAL?

This changes with every new animal I study or see while exploring outside! Right now, I'm curious about the urban wildlife that I have been seeing during COVID; I recently spotted a barred owl and a belted kingfisher in my neighborhood in Washington, D.C., and it's fascinating to see how quickly some animals have adapted to cities with more people working remotely now. My dog Riley will always be my favorite animal, though.

DO YOU THINK A SIMILAR AI COULD BE MADE FOR OTHER THINGS, LIKE AN AI FOR PLANTS? AI FOR BEETLES? AI FOR FAMOUS YOUTUBE CATS?

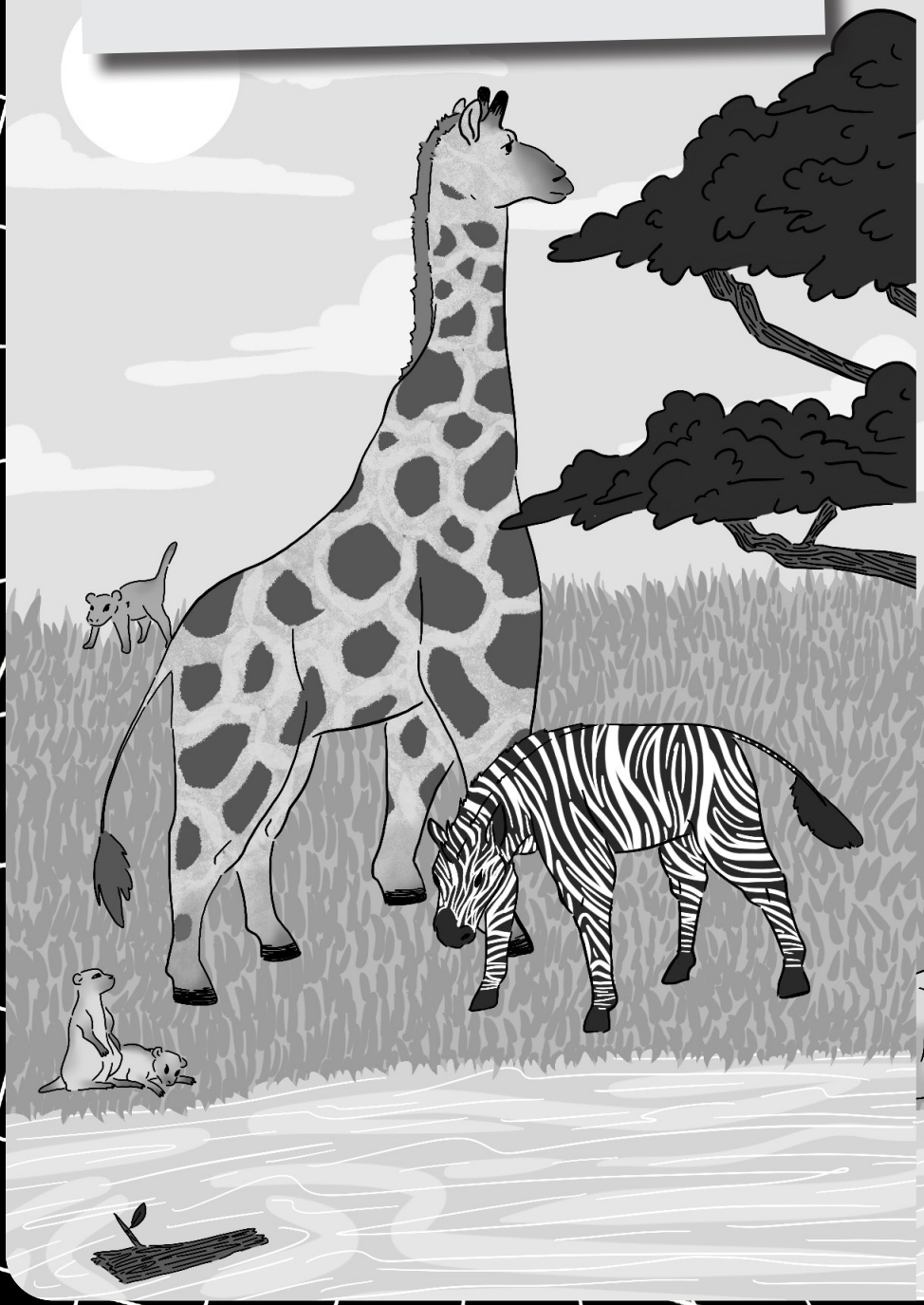
The possibilities for AI are endless! As long as you have enough data to train algorithms how to recognize different individuals or objects, and plenty of creativity and determination, you can use AI for almost anything.

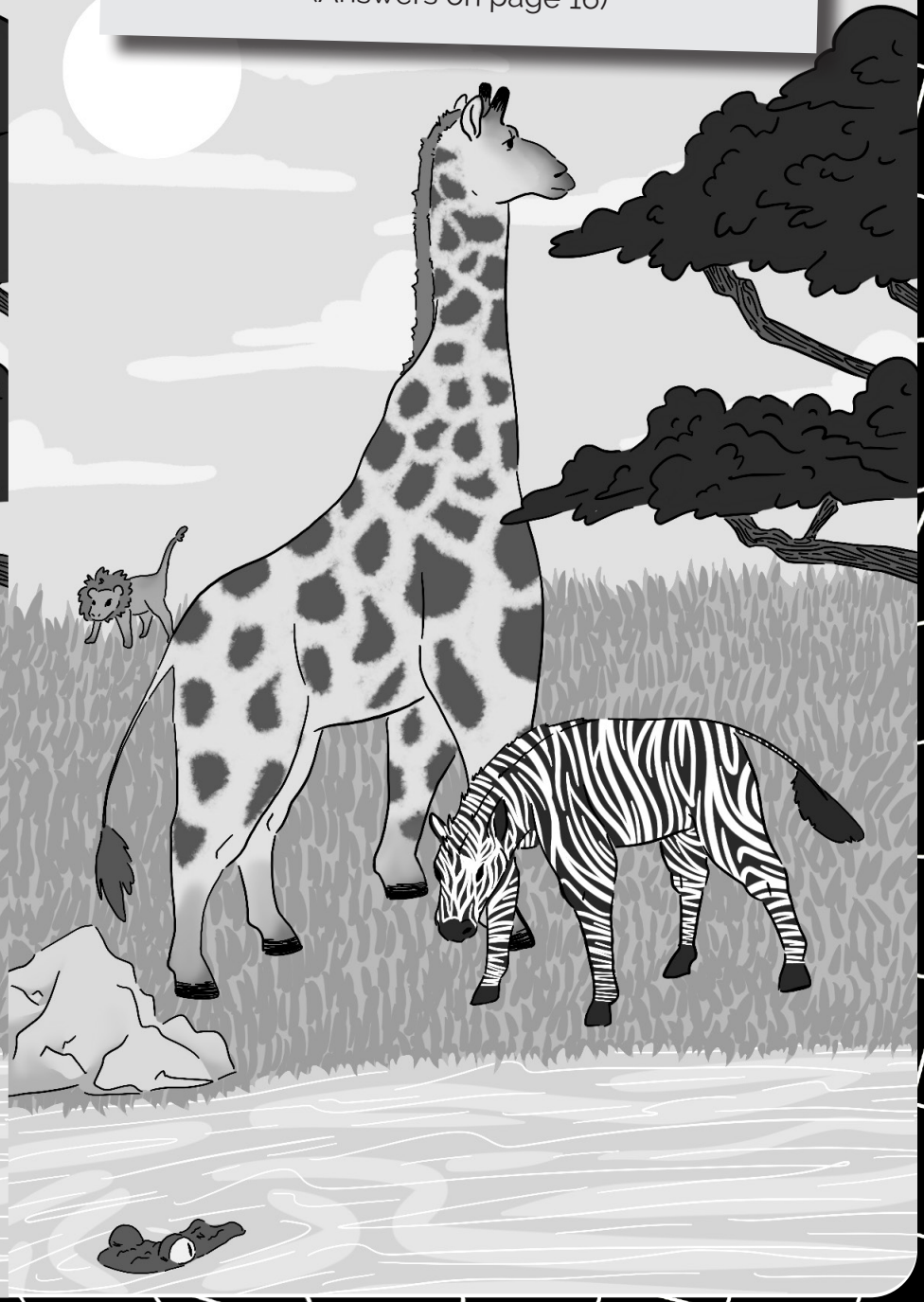
SHOULD EVERYONE HAVE AN AI IN THEIR HOME THAT CAN IDENTIFY PLANTS OR ANIMALS?

I think that the more that people know about the plants and animals that surround them, the more connected they will feel to their community and the more they will want to conserve their environment. There are already apps that harness AI, like iNaturalist, and are easily accessible for anyone to learn about the nature that they see in their house and neighborhood. We can also use AI to contribute to research by volunteering with citizen science projects. Conservation - especially the work that I do with AI - depends on involvement and enthusiasm from people like you!

SPOT THE DIFFERENCE

Now it's your turn to be a wildlife AI! Try to spot the differences between the two pictures!
(Answers on page 16)





DICHOTOMOUS KEY

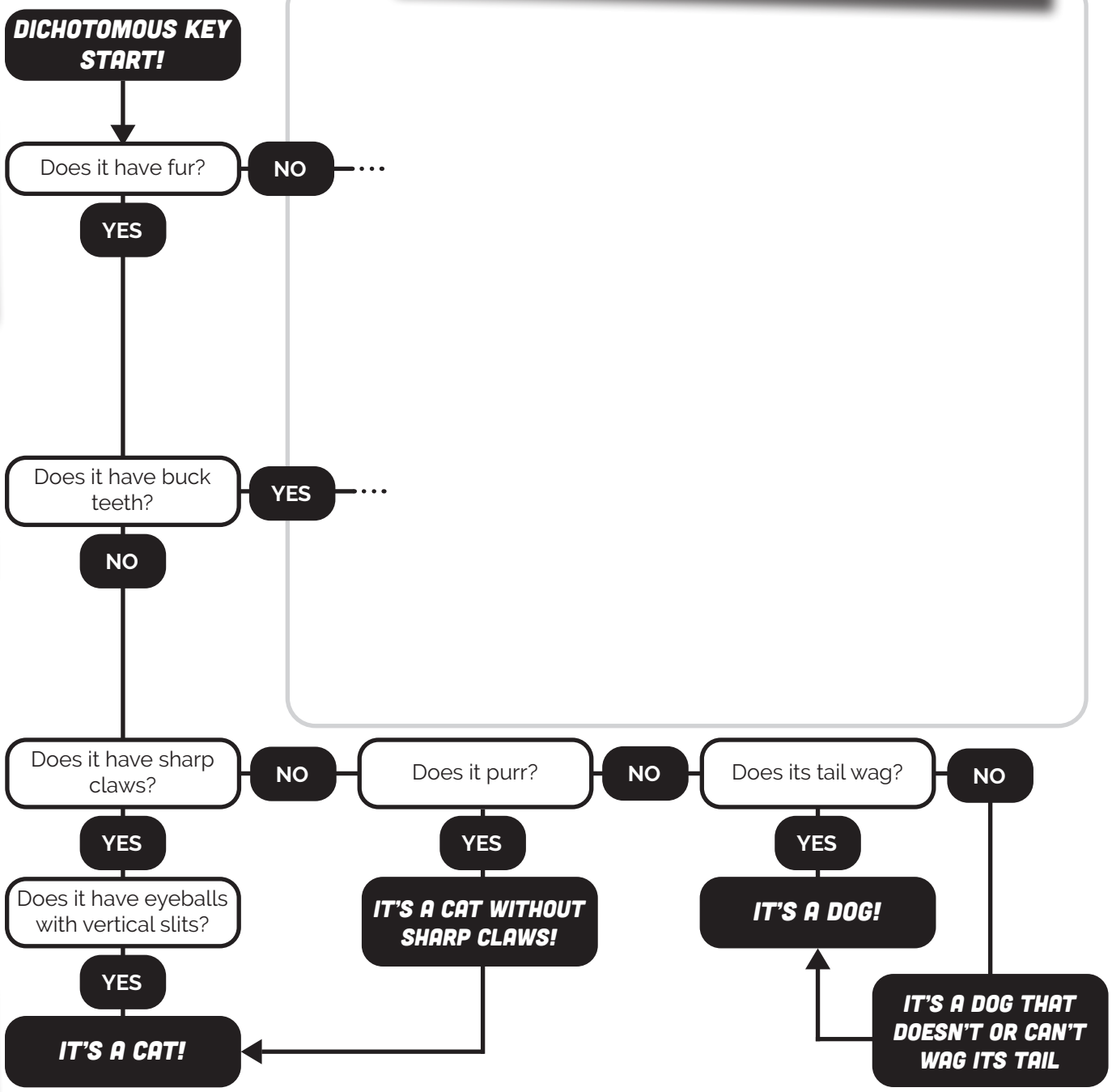
If I show you a picture of two animals, you can probably point at each of them and label one a "dog" and one a "fish". Do you remember learning what those animals were? At one point when we're very young, maybe we can't find the difference between a dog and a fish, or between a dog and a cat. But we learn to look closely at the different parts.

Scientists use the same skills to identify animals and plants! One of the tools that dendrologists (scientists that study trees) and zoologists (scientist that study animals) use is a Dichotomous Key.

Dichotomous Key
(dai-kaa-tuh-muhs key)
A tool that uses sets of choices to help scientists identify plants, animals, and minerals.

The Dichotomous Key asks us to decide if something is more like this or that. Here's an example to compare various house pets. We finished the path to identify cats and dogs. Can you think of other pets and add them to this key? Then, try making your own in order to identify pieces of clothing, technology, or something else completely.

What other pets could you add to this key?



CAPTCHA

Have you ever been asked to verify that you are human online?

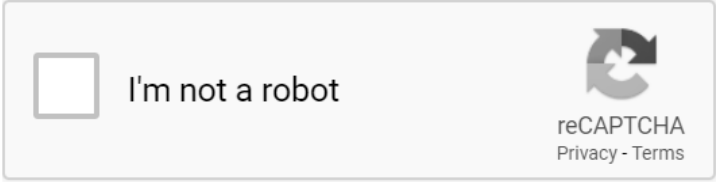
CAPTCHAs are used to verify that a log-in to an online account is made by humans and not computers. These usually take the form of letters or words that are obscured, like the example, that we are asked to type in.

Computers have a hard time reading text that is not clean and neat but for humans it's a much simpler task. By using a CAPTCHA test websites can verify that people and not bots are using their website!

DID YOU KNOW:
By using CAPTCHAs we are actually helping train computer systems to better process and 'read' text and understand images!

What would you want to teach your computer?
How would you teach it that data?

Please check the box below to proceed.



NOTES

SEE YOU NEXT MONTH!

Thank you for participating in this month's Snail Mail! Did you know you can sign up a friend for free? Tell us your favourite part and get involved with other Eureka programs! You can share your projects and drawings with us directly at: codeva.info/SubmitYourSnailMail

Sincerely Yours
The Snail Mail Team

Layout & Design:
Pepper Blush

Activity Contributors & Creative Consultants:
Affia Pollok, Megan McDaniels, Jasper Gunn, Thomas Brownell, Zach Mulcahey, Natasha Blush, Pepper Blush

Logistics:
CJ Carnahan, Affia Pollok, Maggie Smith

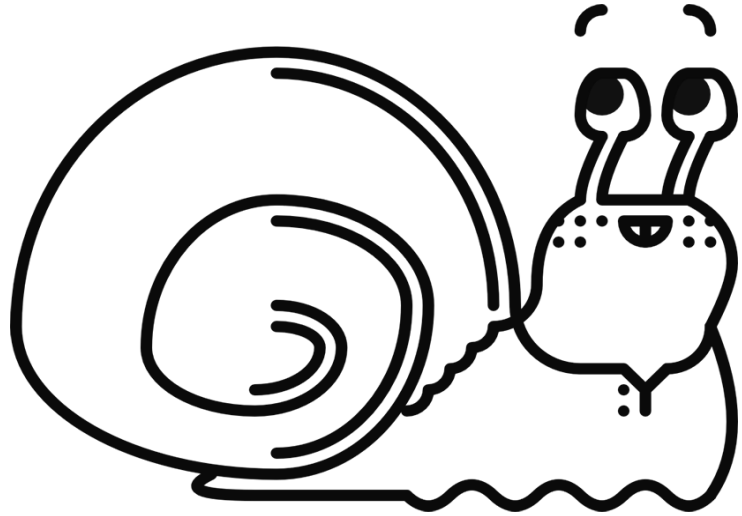
Spanish Translators:
Guiomar Fages, Daniel Ramirez

Editor
Natasha Blush

Cover Art & Illustrations
Kathy Deloria

Spot the Difference Answers:
Lion's Mane
Giraffe Spots
Zebra Stripes
Meerkats/Rock
Log/Crocodile

Enjoying Snail Mail?
Learn more about how we do it at:
CodeVA.info/ProjectSnailMail



RESOURCES

To keep up with what CodeVA and Eureka are doing and to see current class offerings, visit us at **CodeVirginia.org**

Learn more about Wildlife AI
wildme.org
zooniverse.org

AI Games
20q.net
quickdraw.withgoogle.com

Computer Science Classes and Learning
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CodeVA
300 E Broad St
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