BYTE QUEST

Vasavi College of Engineering

Department of Computer Science and Engineering

JANUARY 30, 2020
Volume 78

Contents:

Byte Quest is the article published by the CSE dept of Vasavi College of Engineering regarding the latest innovative Technologies and Software that have been emerged in the competitive world. The motto of this article is to update the people regarding the improvement in technology. The article is designed by the active participation of students under the guidance of faculty coordinators.

 Good, bad or indifferent if you are not investing in new technology, you are going to be left behind.

-Philip Green

 Once a new technology rolls over you, if you're not part of the steamroller, you're part of the road.

-Stewart Brand

FACULTY CO-ORDINATORS

K B BINI (ASST. PROFESSOR)

KOMAL KAUR (ASST. PROFESSOR)

STUDENT COORDINATORS

ESHWAR (4/4 CSE-A)

CAROL (3/4 CSE-A)

R. ABHINAV REDDY(2/4 CSE-A)

SREEEJA(4/4 CSE-B)

D.APARNA(3/4 CSE-B)

K.ANISHA (2/4 CSE-B)

BUTTERFLY COEVOLUTION USING CNN

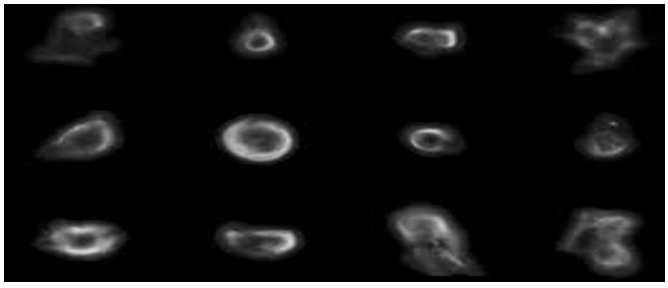
A machine learning algorithm revealed that coevolving butterflies "borrow" physical features from each other, such as wing shape and pattern, and use them to generate novel features over time, researchers reported August 14 in *Science Advances*. The scientists set out to test a model known as Müllerian mimicry, which proposes that species sometimes mimic each other to glean mutual benefits; for instance, a predator might mistake an edible butterfly for a toxic one if the insects look similar, which softens the effect of predation on both species. In the past, it was difficult to quantify phenotypic similarity and thereby test the theory.. "Machine learning is allowing us to enter a new phenomic age, in which we are able to analyse biological phenotypes?what species actually look like at a scale comparable to genomic data," says coauthor Jennifer Hoyal Cuthill, an evolutionary biologist with joint positions at the University of Cambridge, University of Essex, and Tokyo Institute of Technology, in an announcement. After training their algorithm ButterflyNet on 2,400 photographs of *Heliconius* butterflies, the researchers found that the insects both closely copy each other and generate brand-new traits from borrowed ones, thus creating biological diversity.

T. SUBHAS(CSE-A 2/4)

AI PREDICTION OF MELANOMA

Assaf Zaritsky, now at Ben-Gurion University of the Negev, began this work as a postdoc in Gaudenz Danuser's lab at the University of Texas Southwestern Medical Center. He and Danuser, along with colleagues Erik Welf and Andrew Jamieson at UT Southwestern and Andres Nevarez at University of California San Diego, developed a deep neural network that uses machine learning to distinguish melanoma cells that have high versus low metastatic potential—meaning how likely the cancer is to spread..

The authors plan on publishing a preprint of this work on *bioRxiv* in the next month or so, Zaritsky tells *The Scientist* in an email.



N V. KIRAN REDDY(CSE-A 2/4)

BRAIN ACTIVITY PREDICTION

When people listened to questions from a predetermined set and spoke a response from a group of answer options, a computer program could correctly predict the question based on their brain activity most of the time, researchers report today (July 30) in *Nature* Communications.

The study, conducted on three people who had arrays of electrodes temporarily implanted in their brains to monitor their brain activity in preparation for surgery for epilepsy, was funded by Facebook and carried out at the University of California, San Francisco (UCSF).

“This is the first time this approach has been used to identify spoken words and phrases,” coauthor David Moses tells *The Guardian*. “It’s important to keep in mind that we achieved this using a very limited vocabulary, but in future studies we hope to increase the flexibility as well as the accuracy of what we can translate.”

After training on a limited set of questions and answers, a computer model used in the study was able to correctly decode the question a participant heard 76 percent of the time, and the answer that person gave 61 percent of the time, based on the participants’ brain activity, Moses and his colleagues report. Listening and speaking produced activity in different brain regions. While monitoring that activity required an invasive device, Facebook would ultimately like to build a non-invasive gadget that could convert a person’s imagined speech directly to text, with no typing required. “We expect that to take upwards of 10 years,” Mark Chevillet, a research director at Facebook Reality Labs, tells *CNN Business*. “This is a long-term research program.”

Meanwhile, study coauthor Edward Chang has begun another Facebook-sponsored effort, this one working with a single patient who cannot speak, to see whether tracking his brain activity with an electrode array can help him to communicate. “We’ve got a tall order ahead of us to figure out how to make that work,” Chang says in an interview with *CNN Business*.

C. SATHWIK REDDY(CSE-A 2/4)