Saturday Citations: Hippo maxillofacial issues; implicit biases in the game of kings; AI masters Street Fighter

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Credit: Pixabay

They announced the Nobel prizes this week! But did any of the recipients teach an AI to play Street Fighter? Here are a few of this week's stories not yet lauded by international committees of scientists, but which we thought were pretty good:

Galaxies bursty

Even if you think a galaxy is old enough to drink, you should probably go ahead and ask for ID before you serve them. The earliest galaxies in the universe captured by the James Webb Space Telescope appeared too bright, massive and way too old to have formed that soon after the Big Bang, presenting a problem for astronomers and their favorite model, the standard model of cosmology.

Recently, a team of physicists at Northwestern University used computer simulations to model galaxy formation after the Big Bang and demonstrate that (at least in the model universe) stars formed in bursts, producing light of enormously greater intensity than a modern galaxy like, say, Andromeda, where star formation is steady and the number of stars gradually increases over time.

In "bursty star formation," a massive number of stars form all at once; after millions of years, they all go supernova, spraying gas in all directions, which then falls back into the galaxy, driving a new cycle of star formation.

Humans defeated

Reinforcement learning involves training a computer program to make decisions through experimentation and feedback. Previously, researchers have applied reinforcement learning to board games like Chess and Go, producing systems that could beat skilled human players, a civilized preview of the Skynet conflict between humans and machines.

Looking around the scarred landscape of defeated human chess players, researchers at Singapore University of Technology and Design wondered whether reinforcement learning could humiliate humans across other

modes of competitive endeavor, focusing their attention on [training a system to play the 1987 arcade game Street Fighter](link).

In case you were busy in 1987 learning other skills like Chess or Go, in Street Fighter, you compete one-on-one in 30-second matches against a series of preprogrammed opponents. In matches that end without knockouts, the fighter with the greater remaining amount of energy wins. The researchers provided their movement design software with millions of initial movements; over time, the program adjusted character movement or its strategy until it arrived at paths to defeating the preprogrammed opponents.

The researchers believe the results could impact robotics, video game design and autonomous driving.

Girls underrated

The development of biases can be a kind of cognitive shortcut that speeds heuristic decision-making and generally keeps your brain's fan from activating every time you have to buy cereal. But walking around looking at the world through a Terminator-vision HUD that labels individual people with learned associations ultimately has broad and far-reaching consequences that can affect society and its institutions, such as the U.S. Chess Federation.

As a further confirmation that most human beings are ambulatory wads of implicit biases, researchers at New York University [report](link) that parents and coaches of youth chess players are more likely to rank the highest potential of girl players lower than that of boy players. Additionally, coaches are more likely to believe that female mentees are likelier to quit the game due to lack of ability than male mentees.

Real-world numbers would seem to back up the study results; the

researchers point out that only 13% of U.S. Chess Federation players are women. However, the study also found no biases in the resources coaches and parents are willing to invest in female versus male youth players.

Hippos hungry, hungry

The hippo's conundrum: They want to exist as semi-aquatic vegetarians. On the other hand, they like to fight a lot, mostly with their mouths, and evolution has endowed them with huge masseter and digastric muscles and they can open their gigantic jaws to nearly 180 degrees. They use their huge canine teeth as weapons and block attacks with their incisors. And their "yawning" behavior toward rivals is believed to be a threat display. LOOK UPON MY GIANT PIEHOLE AND DESPAIR.

According to researchers at the University of Zurich, all of this means that hippos also turn out to be really inefficient vegetarians, because the size and arrangement of their teeth prevent them from grinding their jaws from side to side. Just try gnawing on a celery stalk using nothing but up-and-down chewing motions and you'll have some idea of the challenge confronting hippos.

The authors note that their inefficiency at chewing may also have consigned them to their modern semi-aquatic lifestyle of bouncing along the bottoms of rivers with their notable lack of buoyancy.