

Humans and the Environment

By Yi Guo 

The COVID-19 pandemic has changed a lot of things, one of which is human behavior. For me, I found a new hobby of hiking during the first year of the pandemic. I hiked in dozens of state parks around me during the fall and

winter seasons, some of which I did not even know existed before the pandemic. I felt relieved both physically and mentally after the weekend hiking trips, and it was helpful

for me to reduce the Zoom fatigue built up during work days.

Nature creates the environment that we live in. Environmental damage can lead to new diseases. Nearly two-thirds of the hundreds of diseases that emerged in the past century were transmitted from animals to humans, including HIV/AIDS and probably COVID-19. Scientists also found a correlation between the loss of forests in Africa and the outbreaks of Ebola. Altering land use threatens biodiversity, and deforestation and intensive farming are linked to outbreaks of transmitted diseases. Also, scientists have studied how people have altered living organisms and exerted an evolutionary pressure on other species.

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We need to nurture the environment we live in and avoid environmental damage that essentially endangers human health.

The role nature plays in human welfare and economic activity has been overlooked. Complex natural systems can flip from one equilibrium to another when under pressure. The demands humans currently place on nature may not be sustainable by Earth's ecosystem. Natural capital was recently included in an analysis of the sustainability of current rates of economic growth. As we learn more through interaction with nature, it is necessary to be aware of the sustainability of the ecosystem around us and pay attention to the impact of human behavior and what new technology will impose on the environment.

Robots can help protect the environment by adding monitoring capabilities in extreme conditions, such as robotic vehicles for supply transport, under-ice exploration to support climate change studies in the Arctic, and surface and underwater robots to monitor chemical and oil pollution. Robotics can also help fight climate change by reducing carbon emissions through renewable energy resources, helping crops survive droughts, and planting trees. We need more and more innovative robots to join humans' effort to protect the environment. We have no choice.

Bioinspired robotics is a field of robotics that studies biological systems to achieve engineering goals. Among the well-studied topics, locomotion



concepts involve principles found in nature for creating robot locomotive capabilities; multirobotic systems study how animal swarms communicate and exchange information and the hierarchical

and territorial structure of animal societies; and robotics learning draws inspiration from human learning and neural network-based brain cognition capability. The field of soft robotics stems from bioinspired concepts and research on deformable structures, soft materials, and morphological computation. While bioinspired robotics is a very broad research area, challenges exist in many frontiers, including the integration of science and technology advances toward enhanced robotics capability in perception, cognition, learning, and control.

This December issue is a special issue (SI) on biomimetic perception, cognition, and control: "From Nature to Robots." We received more than 30 submissions to this themed issue, which is the highest number of SI submission in the past two years. I'd like to thank the lead guest editor, Dr. Chenguang Yang, and his team, Dr. Shan Luo, Dr. Nathan Lepora, Dr. Fanny Ficuciello, Dr. Dongheui Lee, Dr. Weiwei Wan, and Dr. Chun-Yi Su, for their hard work managing the peer review process within the constrained time frame of this SI. I'd also like to thank the assisting *IEEE Robotics and Automation Magazine* associate editor, Surya Nurzaman, for his help on the SI. I hope you find inspiration from the feature articles. Enjoy reading!