Computer Sciences in the Post-COVID Era

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The COVID-19 pandemic has so far caused hundreds of millions of infections and millions of deaths. Even though infections are currently spiking in many nations and there is lingering concern that the virus's variants may still cause infections to surge in heavily vaccinated communities, many can begin to see the end of the pandemic as the vaccination campaign accelerates worldwide.

Arguably the greatest global crisis in our lifetime, the pandemic has, over a short period of time, already changed the way we live, work, learn, and interact with others in significant ways; and some of the changes will likely remain with us to become part of the post-pandemic normality. Reflecting on the carnage and misery the pandemic has brought upon the world, as well as the challenges and opportunities for each of us to become more effective in our efforts to contribute to society, it is instructive for computer sciences researchers to contemplate ways that our discipline can better serve the common good in the years ahead.

Computer sciences, broadly construed to include computer engineering, information technology, and related fields, have in the past led to the development of technologies that are now necessities of our daily lives. As a result of the pandemic experience, enhanced tools to support telework, remote learning, video conferencing, shopping, and entertainment, etc., will soon become available with 5G deployment. Going forward, computer sciences professionals can be expected to increasingly collaborate with professionals in the bio-medical and related fields in the development of products and services such as more efficacious vaccines and medicines, enhanced predictive and prescriptive models for epidemiology, better data analytic algorithms and methodology for managing pandemic diseases, economical and user-friendly tele-medicine platforms, and smartphone apps for prevention, detection, and treatment of diseases.

As the world begins on the path of recovery from the COVID pandemic and initiates numerous collaborative endeavors to prepare for the future, one does not lose sight of the long-standing global problems of climate change, environmental degradation, economic inequity, and social injustice, as well as the ills of the increasingly polarized politics in many places. Research in computer sciences will lead to new technologies that can contribute to ameliorating these problems. For one example, effective algorithms may be developed to analyze social media to detect things that have lately posed serious threats to democracy, public health, and security—fake news, manipulated multimedia (such as deepfake videos, steganography, etc.), hate speech, and bots that spread malware, propaganda, conspiracy, and disinformation.

Competition for global leadership will intensify international race in strategic research areas, including the computer sciences fields of AI, quantum computing, bio-medical informatics, and cybersecurity. Though some of the research will be secretive or proprietary, much of it would eventually benefit the whole world in various applications, just as research in the past aimed for military purposes has brought us the radar, the GPS, and the Internet, etc.

Realizing the importance of computer sciences related research, nations of the world can be expected to invest in increased support for computer sciences research in the post-COVID era, and the

fruitful research outcomes are expected to bring tremendous benefits in the decades ahead, above and beyond contributing to the world's recovery from COVID.

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