

Norbert Wiener and his Impact on India

Prof. T V Gopal

Conference Chair (21CW2020) & Professor Department of Computer Science and Engineering
College of Engineering Anna University Chennai - 600 025, INDIA
e-mail: gopal@annauniv.edu ; gopal.tadepalli@gmail.com

and

Prof. Greg Adamson

Programme Chair (21CW2020) & Associate Professor and Enterprise Fellow in Cyber Security
School of Computing and Information Systems
University of Melbourne, Parkville, VIC, Australia
e-mail: greg.adamson@unimelb.edu.au; greg.adamson.engineer@gmail.com

"As in the case of my earlier experiences in China and Mexico, so in my Indian trip my motive was more than restlessness or idle curiosity. More and more Indian authors are publishing in our scientific journals, and we need the Orient more and more to supplement a West which is showing the intellectual and moral enfeeblement following two World Wars." - **Norbert Wiener, "I Am a Mathematician", MIT Press, Pp339, 15 August 1964**

Professor Prasanta Chandra Mahalanobis, the father of the statistical movement in India, founded [1931] the Indian Statistical Institute [ISI], initially at the Presidency College, Calcutta, to carry on research in the theory and applications of statistics in India. The ISI was the first institute of its kind anywhere in the world devoted mainly to the study of statistics. For seven months from late 1955, Norbert Wiener worked at the Indian Statistical Institute [ISI] at the invitation of Prasanta Chandra Mahalanobis. Prasanta Chandra Mahalanobis visualised statistics as a technology applicable in diverse fields of the natural and social sciences and believed that statistics could grow well only in an environment where active quantitative research in its various domains of application went on side by side with research in statistical theory and methodology.

During Norbert Wiener's visit to ISI, Gopinath Kallianpur received training from him in the field of prediction theory for which he expresses his "profound scientific debt" to Wiener. Wiener managed to secure a two-year leave for Kallianpur from ISI to facilitate a long-term collaboration between them in the area of nonlinear prediction theory. However, this project did not materialize as Kallianpur suffered a prolonged illness soon after reaching the US. Nevertheless, he notes that, even though his work on nonlinear filtering theory (for which he is well known) began as a collaboration with C. Striebel at the University of Minnesota, motivation for it came from Wiener. Kallianpur later returned to ISI to become its first Director in 1976 under its new Memorandum of Association. It was due to his efforts that the Bengaluru campus of the Institute was established.

In 1990, P.R. Masani wrote a biography of Norbert Wiener. This biography not only depicts Wiener the mathematician, but also describes his personality to some extent, detailing his interests in many other fields such as cybernetics, economics and also the philosophy of religion. Cybernetics, an interscientific discipline concerned with "communication and control in the animal and the machine" (as defined by Wiener) interested Masani, and he published papers in this area. Both Wiener and Masani had a much broader perspective on cybernetics which even included the philosophy of scientific methodology, rather than the narrow approach of machine learning which many take it to be

Both Gopinath Kallianpur and P.R Masani are ranked in the top five statisticians in India.

Norbert Wiener lectured in India for seven weeks in 1953 at:

- Atomic Energy Institute, Bombay
- Indian Academy of Sciences, Ahmedabad
- National Chemical Laboratory, Pune
- All India Science Congress, Hyderabad
- Indian Academy of Sciences, Bangalore
- Tata Institute of Fundamental Research, Bombay
- Indian Statistical Institute, Calcutta
- National Physical Laboratory, Delhi

The 21st Century Norbert Wiener Conference with the theme: "Being Human in a Global Village" is the third in a series of conferences initiated by the IEEE Society on Social Implications of Technology (SSIT), following events in Boston (2014) and Melbourne (2016). The 2020 event invites us to consider how we – as policy makers, parents, citizens, business owners, researchers, humans – need to be proactively preparing for a new world in light of the challenges coming our way

in the form of artificial intelligence, or machine learning. For instance, young people need to be flexible and adaptable as the workplace in 20 years' time will be very different from today.

This conference will have three general themes:

- The state of technologies initiated by Wiener.
- The social impact of those technologies.
- Wiener's 1950s engagement and travels in India.

Since 2010, the Computer Society of India [CSI], the IEEE India Council and other sister Institutions have been organizing India events to support the series of conference on Norbert Wiener by the IEEE SSIT. We are thankful to Devi Ahilya Viswavidyalaya, Indore, Indian Statistical Institute, Kolkata, Indian Institute of Information Technology, Allahabad, CR Rao Advanced Institute of Mathematics, Statistics and Computer Science, Hyderabad, Indian Institute of Science, Bengaluru, Central University of Rajasthan, Kishengarh, Rajasthan and Indian Institute of Technology, Mumbai.

Anna University has been taking the lead in all the events in this series through forstoring research in the area of "Cyber Physical Systems". We thank the Board of Governors of IEEE SSIT for fully sponsoring the 3rd 21st Century Norbert Wiener Conference scheduled at the CEG Campus, Anna University between 23 – 26 July 2020. This conference is a part of the 225 years celebrations of the CEG Campus of Anna University. Please visit the Conference Website at <http://21stcenturywiener.org/>

Also visit:

- https://www.annauniv.edu/pdf/21CW2020_Brochure_09Oct2019.pdf
- <https://technologyandsociety.org/event/ieee-3rd-conference-on-nobert-wiener-in-the-21st-century/>
- <http://ieeecs-madras.managedbiz.com/icnl/19q3/p57.pdf>

References:

1. G. Adamson, R R Kline, K Michael & M G Michael, Wiener's Cybernetics Legacy and the Growing Need for the Interdisciplinary Approach [Scanning Our Past]. *Proceedings of the IEEE*, Vol. 103, Issue 11, 2015, pp 2208-2214.
2. G. Adamson, "Norbert Wiener and Prasanta Chandra Mahalanobis," *2012 IEEE Conference on Technology and Society in Asia (T&SA)*, Singapore, 2012, pp. 1-5.
3. G Kallianpur, Norbert Wiener and Probability Theory - Some Reflections, *Resonance*, January 1999, pp 32-35,
4. P.R. Masani, Norbert Wiener 1894-1964, Basel: Birkhauser Verlag, 1990.
5. T K Kumar. An Unfinished Biography: Prasanta Chandra Mahalanobis, *Economic and Political Weekly*, Vol. 32, No. 23, 1997, pp 1321-1332.

About the authors



Dr. T V Gopal is presently teaching Computer Science and Engineering at CEG Campus, Anna University. One of his research areas includes "Science and Spirituality". Dr. T V Gopal has published around 80+ Research Papers. He has written four books and Co-Edited Eight Conference Proceedings. He is actively associated with many professional societies such as CSI, IEEE and ACM India Council. He is an Expert Member of the Editorial Advisory Board of the International Journal of Information Ethics. Dr. T V Gopal is also the Co-Ordinator for the Center for Applied Research in Indic Technologies [CARIT], Anna University. More at <https://vidwan.inflibnet.ac.in/profile/57545>



Dr Greg Adamson is an Associate Professor and Enterprise Fellow in Cyber Security at the University of Melbourne School of Engineering. He has worked in cyber security for 25 years, in Australia and the UK, for government, industry and academia. Companies he has worked with include the BBC, Australian Quarantine and Inspection Service, Fujitsu, the Royal Bank of Scotland, and Telstra. The most recent industry engagement was 8 years with ANZ's Transaction Banking, a \$1.7bn business unit, where he introduced consideration of cyber risk into business planning. Greg has worked with blockchain since 2014, and has a strong interest in its governance. He established the Blockchain Special Interest Group at the Institute of Electrical and Electronics Engineers (IEEE), the 430,000 member global technical professional organisation operating in 161 countries. He is on Standards Australia blockchain standards technical committee. He also specialises in professional ethics, and recently moved successful amendments to the IEEE's Code of Ethics, requiring members to consider issues of ethical design practice, and be cognisant of the role of intelligent systems. He considers the development of ethical practices to be critically important in addressing technology challenges as the world becomes increasingly and inseparably linked to advanced technologies. He also consults on these subjects, as Principal at Digital Risk Innovation.

"Progress imposes not only new possibilities for the future but new restrictions"

- Norbert Wiener, *The Human Use of Human Beings: Cybernetics And Society*, Houghton Mifflin, USA, 1950