_____

20th Foundation Day – SETS

25, June 2021

Dr Sarat, Executive Director, SETS welcomed the distinguished gathering. He presented an account of SETS activities and the vision of SETS as formulated by Dr Chidambaram, Homi Bhabha Chair, BARC and Former Principal Scientific Adviser to the Government of India. He expressed that Prof. K Vijayraghavan, Principal Scientific Adviser to the Government of India is instrumental in scaling up SETS activities in emerging technologies. He detailed the industry and academia collaborations of SETS including the recent signing of MoU with IDRBT.

Prof. K VijayRaghavan delivered the Presidential Address. He stressed the importance and relevance of Athamanirbar Bharat and recommended SETS to explore advanced technologies like Quantum cryptography, hardware security, 5G, etc. The PSA office initiation to boost the R&D activities in those areas were also highlighted. He emphasized the 'Responsible AI for All' mission and appreciated that SETS has coordinated the discussions and played an important role in framing the taskforce report on CyberSec4AI. He appreciated SETS role in developing Integrated Threat Management Appliance, VPN solutions for secure remote working and for taking part in multi-institutional research projects on emerging technologies such as Physically Unclonable Functions (PUF), Hardware Trojan Detection, Unified Blockchain Framework, Ransomware Analysis and Post Quantum Cryptography. He congratulated SETS on its 19-year journey and concluded the address with his best wishes for continued growth of SETS in the years to come.

Dr R Chidambaram gave the Chief Guest address. He mentioned that members of SETS are working on all frontiers of cybersecurity. He also discussed the SETS interactions with the Government of Tamilnadu in conducting training programs for CISOs, seminars, and webinars and with IDRBT on collaborative research opportunities in the areas of AI, Blockchain etc. He recommended SETS focus on zero-day attacks like the recent supply chain attack (Sunburst). He felt that SETS has chosen the right path by taking up activities in the area of Quantum Security (QKD and PQC). He appreciated the efforts of SETS joining IIT, Madras and C-DAC to establish Metropolitan Area Quantum Access network (MAQAN). He felt that the indigenously developed solutions such as VPN, ITMA2 etc by SETS is the need of the hour. He appreciated SETS involvement in arriving at a Task Force report on CyberSec4AI under the chairmanship of Prof. Ravindran Balaraman, IIT Madras. He wished rewarding journey of SETS in its cyber security endeavours.

Dr Arabinda Mitra, Scientific Secretary to the Principal Scientific Adviser to the Government of India gave the Guest of Honour address. He stressed building the knowledge economy to digital economy. He quoted the prevailing two viruses causing a pandemic: Corona and cyber virus. He highlighted the Importance of thwarting state actors and recommended areas of exploration in Knowledge Creation, Knowledge Application and Knowledge Dissemination: educating members and institutions by increasing the skilled manpower; acting as an incubator and start-up propeller; establishing a closer connection with entities: Society, people and market; Balancing between the hardware and software race; He wished SETS to grow aiming at these targets.

Shri N Sitaram, Former DS&CC (R&D), DRDO & Chairman -Governing Council (GC), SETS presented the GC Chair Address. He congratulated SETS on its growing reputation in recent years. He discussed the importance of the talks scheduled for the afternoon session. He recommended SETS to look on to the evaluation of IT products. He highlighted the growing trends of manipulation of AI by developers, e.g., social media and big data relevance for AI, ML systems have created targeted issues during the Covid-19 pandemic. He suggested SETS explore areas focusing on fake news detection and could be accounted as a part of the SETS roadmap.

Dr P K Saxena, PSA Fellow & Former Director SAG, DRDO, Office of PSA to GoI & Chairman -Advisory Board (AB), SETS delivered the AB Chair Address. His talk highlighted about the ideation and journey of SETS. He discussed the expertise and working areas of the SETS team and the technologies planned to be focused on in the forthcoming years. He made remarks on the collaborations of SETS amidst growing recognition and needs. He wished SETS to in its scientific and technical activities and grow stronger.

Prof G Raghavan, DIAT, Pune gave the Foundation Day talk on "Quantum Communication and Security". He explained the analogy between biology and cybersecurity like the battle between the virus and immune system. He impressed upon the importance of Quantum Random Number Generator (QRNG) and is a major technological shift with regards to the random number generation in the area of cryptography. The talk detailed on the concepts of non-locality and randomness beyond quantum mechanics. He discussed the impact of bell-inequalities in deciding the quality of randomness.

The program concluded with the vote of thanks by Dr. D Lakshmanam, Chief Administrative and Accounts Officer, SETS.

The Technology Session was chaired by Dr P V Ananda Mohan, Life-Fellow IEEE and Former Executive Director, ECIL.

Dr Prem Laxman Das, Senior Scientist, SETS delivered a talk on 'Cybersecurity for Machine Learning. The talk focussed on the privacy and confidentiality issues in the context of Machine Learning and outlined techniques for addressing them.

Ms Suganya Annadurai, Senior Scientist, SETS delivered the talk on 'Side-Channel Attack on AI algorithms. The talk focusses on the effectiveness of NN and obtaining sensitive information including the activation function used, the number of layers, the number of output classes, and weights in the neural networks are retrieved by exploiting the side channel information such as power, timing or Electro-Magnetic traces.

Mr Kunal Abhishek, Scientist, SETS delivered a talk on 'Identity Powered Security in Zero Trust Network '. The talk focussed on existing frameworks for identity management that can be easily and reliably enabled for authentication in dynamic and heterogeneous environments.

Dr V Natarajan, Scientist, SETS presented on 'Quantum Cyber Defence using Artificial Intelligence'. This talk highlighted areas of possible concerns and concluded that it is important to examine the possibility of implementing artificial intelligence techniques for designing proactive quantum cyber defence systems.

Key members who participated in the Foundation Day of SETS are:

Prof. Ranjan Bose, IIIT-Delhi & GC Member, SETS, *Cmde Anand A* (Retd), Center Director, Centre for Mathematical Studies and Analysis, NTRO, *Dr M S VijayaRaghavan*, Founder ED, SETS, *Shri Suresh Kumar,* Scientist-'H'/ HoD, O/o PSA, *Prof D Janakiraman*, Director, IDRBT, Hyderabad, *Dr S D Sudarsan*, Executive

Director, C-DAC, Bangalore, *Shri S A Kumar,* Director, National Supercomputing Mission, MeitY, Government of India, *Shri S Gopinath*, Senior Technical Director (Scientist-'F'), NKN, NIC, *Dr V N Sastry*, IDRBT, Hyderabad, *Shri S P Dixit*, Former Executive Director, C-DAC, Pune, *Prof B C Jinaga, F*ormer Rector, JNTU, Hyderabad and they conveyed their well wishes to SETS in its future endeavours.