CYBER SECURITY LAW, ITS REGULATION AND RELEVANCE FOR OUTER SPACE

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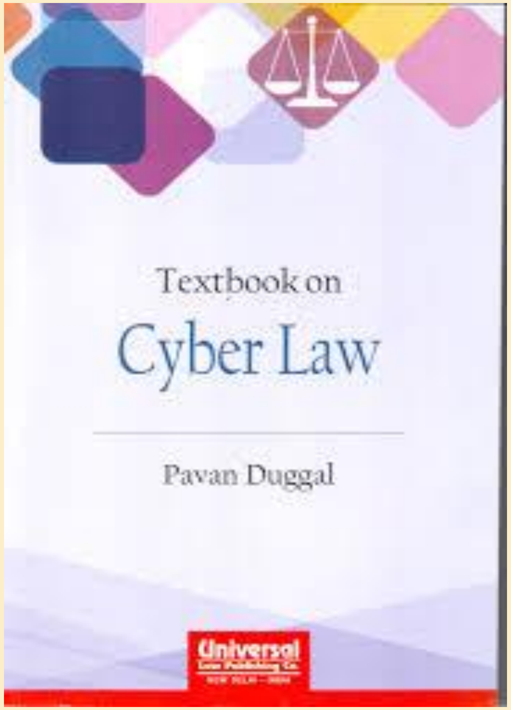
A PRESENTATION
BY
PAVAN DUGGAL
CHAIRMAN, INTERNATIONAL COMMISSION ON CYBER SECURITY LAW,
PRESIDENT, CYBERLAWS.NET,
ADVOCATE, SUPREME COURT OF INDIA

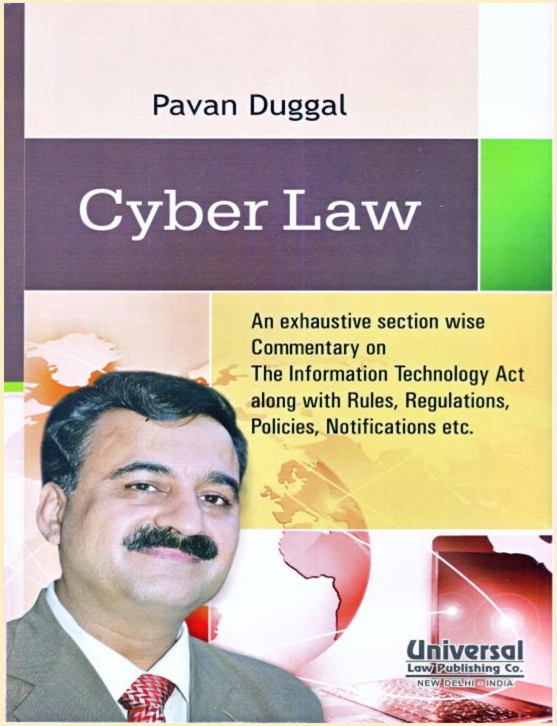
INTERNET – A COMMON HUMAN HERITAGE

- Internet- One of the most significant developments in human civilization after the advent of fire
- Today, Internet is the common backbone of the world's information economy and knowledge society

INTERNET – A COMMON HUMAN HERITAGE

- Cyberspace governed by law known as Cyberlaw
- The law of Internet, World Wide Web and Cyberspace
- Various sub disciplines evolving therein

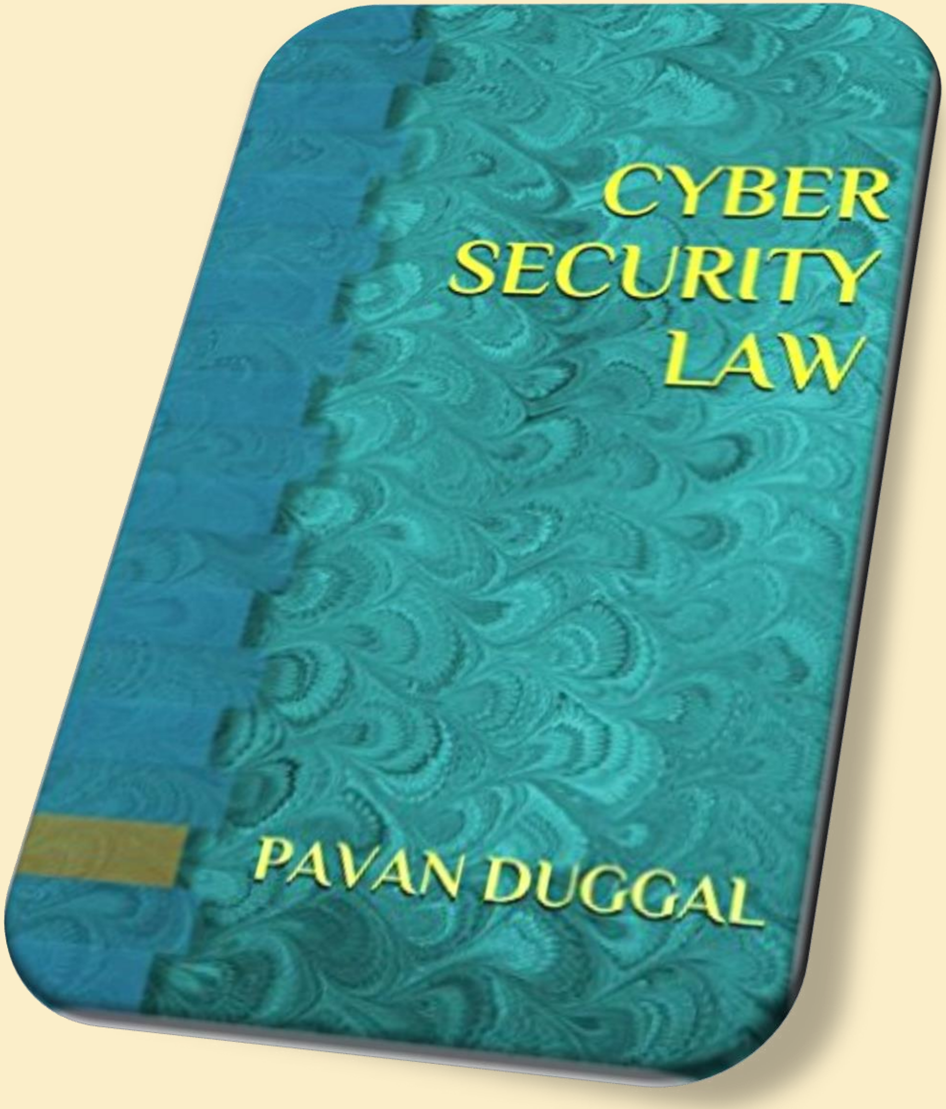



Pavan Duggal
Cyber Law
An exhaustive section wise Commentary on The Information Technology Act along with Rules, Regulations, Policies, Notifications etc.
Universal Law Publishing Co. NEW DELHI - INDIA

CYBER SECURITY

- One of the most prominent disciplines evolving concerns Cyber Security

CYBER SECURITY LAW



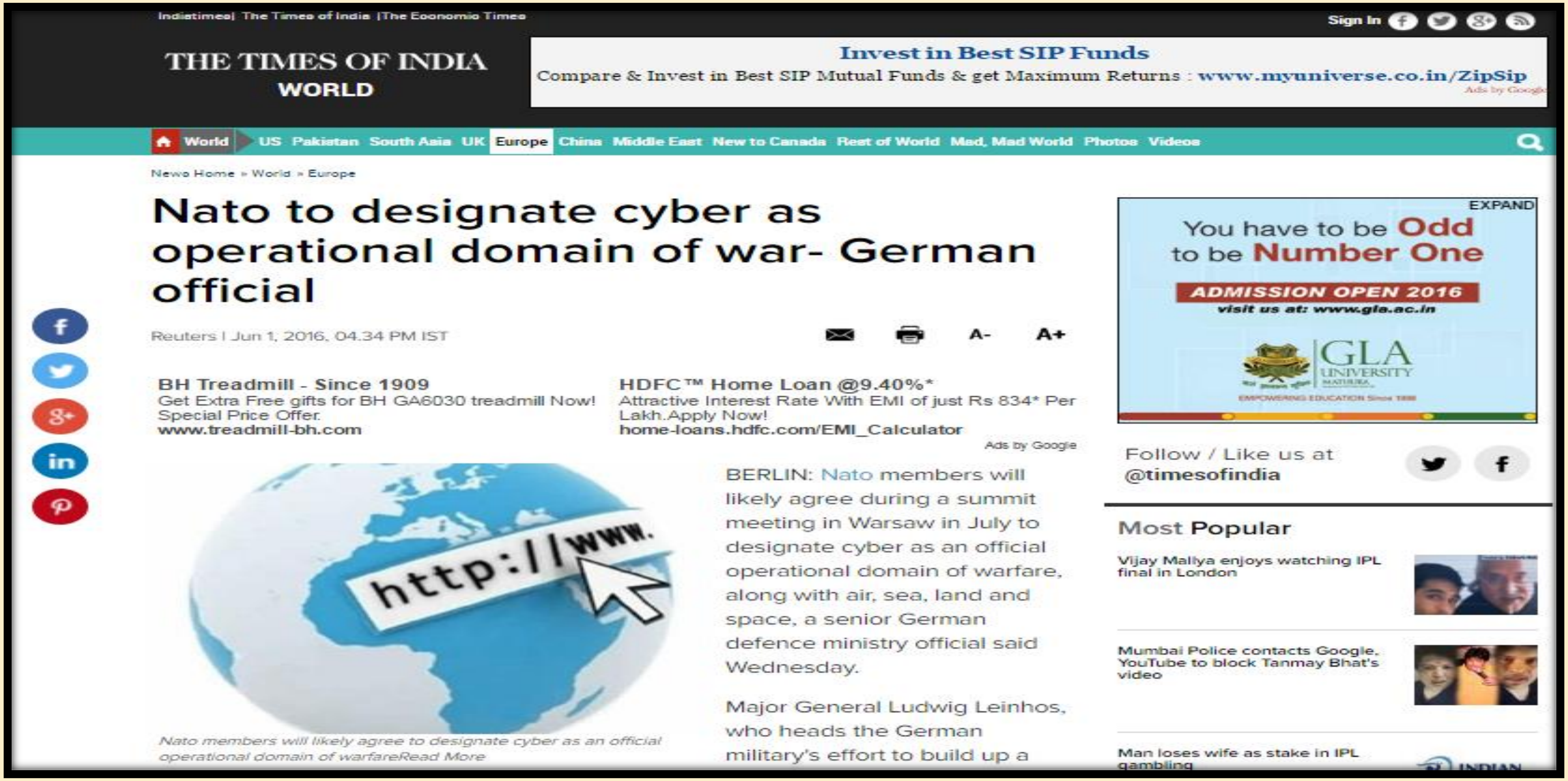
CYBER SECURITY LAW

PAVAN DUGGAL

CYBER SECURITY LAW – NEW DISCIPLINE OF LAW

- Cyber Security Law can be defined as "*the new emerging legal discipline within the Cyberlaw umbrella, which deals with all the legal policy and regulatory issues pertaining to cyber security, its protection, preservation, maintenance and continued updation.*"

CYBER – NEXT DOMAIN OF WARFARE



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Nato to designate cyber as operational domain of war- German official

Reuters | Jun 1, 2016, 04.34 PM IST

Nato members will likely agree to designate cyber as an official operational domain of warfareRead More

BERLIN: Nato members will likely agree during a summit meeting in Warsaw in July to designate cyber as an official operational domain of warfare, along with air, sea, land and space, a senior German defence ministry official said Wednesday.

Major General Ludwig Leinhos, who heads the German military's effort to build up a

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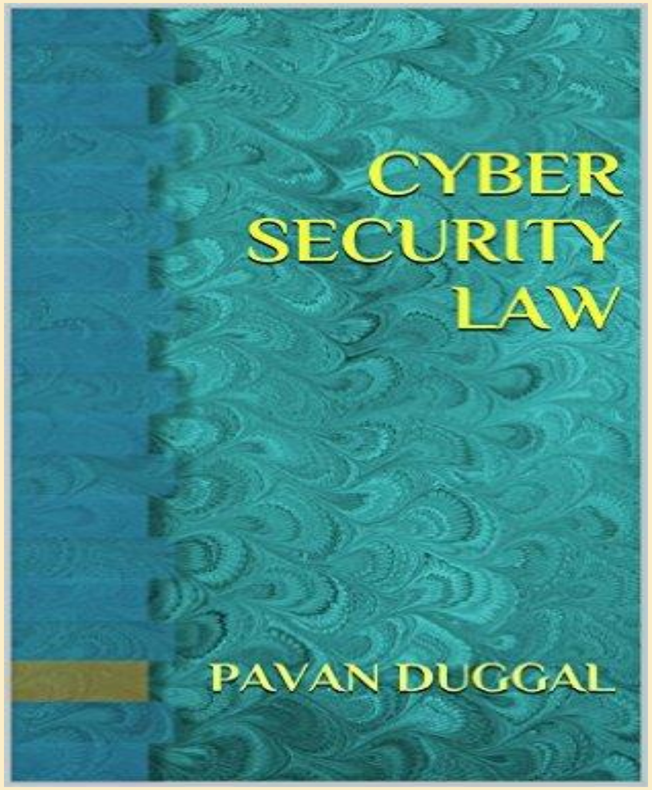
CYBER SECURITY LAW, ITS REGULATION AND RELEVANCE FOR OUTER SPACE

- Cyber Security Law and regulation of cyber security is of direct relevance for Outer Space.
- Information Technology issues and cybersecurity issues have already became part of outer-space infrastructure.



ACTIVITIES IN OUTER SPACE-RECENT STATISTICS

- The year 2016 saw a total of 85 known orbital launch attempts operated by eight nations from space ports in nine different countries.
- 2016 ranks third in the current century in terms of the total number of orbital launch attempts, short to 92 attempts in 2014 and 87 in 2015, and tied with 85 attempts in 2000.

OUTER SPACE INCIDENTS

- In 2011, a report by the US-China Economic and Security Review Commission reported that two US satellites had been compromised in 2007 and 2008 through a ground station in Norway. The attack was carried out via the internet.

OUTER SPACE INCIDENTS(CONTD)

- The severity of the attack was especially alarming because, at least in the 2008 attack, the hackers were able to achieve all steps required to command the satellite, though no harm was done. Potentially, the hackers could have stolen data, redirected the solar panel array to destroy them or even moved the satellite to cause a collision.

OUTER SPACE INCIDENTS(CONTD)

- A third incident was reported in 2014 when a satellite operated by the US National Oceanic and Atmospheric Administration confirmed that a hacking on one of its satellites had been detected, though none of its data was compromised.

ACTIVITIES IN OUTER SPACE-RECENT EVENTS

- The US Office of Inspector General (OIG) has revealed several Internet based vulnerabilities in NASA computers systems, including those that control spacecraft like the International Space Station and Hubble Telescope.

ACTIVITIES IN OUTER SPACE-RECENT EVENTS

- Also found were network servers that revealed encryption keys, encrypted passwords, and user account information to potential attackers. These data are sensitive and provide attackers additional ways to gain unauthorized access to NASA networks (Martin 2011).

CYBER THREATS TO OUTER SPACE

- ❑ Cyberthreats against space-based systems may be classified as follows:

- ✓ States setting out to create military advantages in space, or seeking to steal strategic quantities of intellectual property and having sufficient computing power to crack encryption codes, for example;

- ✓ Often well-resourced organized criminal elements seeking financial gain;

GROWING THREATS IN OUTERSPACE

- ✓ Terrorist groups wishing to promote their causes, even up to the catastrophic level of satellite collisions with space debris including a cascade of collisions – called the Kessler Effect, denying the use of space for all actors;
- ✓ Individual hackers who simply want to prove and fanfare their skills;
- ✓ Any combinations of the organizations and individuals above.

GROWING THREATS IN OUTERSPACE

- ✓ Jamming, spoofing and hacking attacks on, for example, communication networks, by using space infrastructure;

- ✓ Attacks on satellites, by targeting their control systems or mission packages, perhaps taking control of the satellite to exploit its inherent capabilities, shut it down, alter its orbit (perhaps thereby 'weaponizing' it), or 'cook' or 'grill' its solar cells through deliberate exposure to damaging levels of highly ionizing radiation;

CYBER SECURITY LAW, ITS REGULATION AND RELEVANCE FOR OUTER SPACE

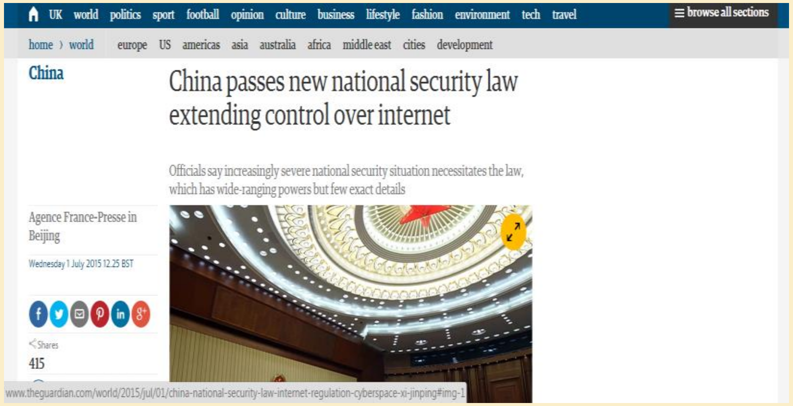
- Increasingly today outer space is using rockets, satellites and other vehicles which are using data and information in the electronic form and also extensively using computers, computer systems, computer resources, computer networks and communication devices.
- Hence, cyber security of outer space activities is already gaining centre-stage attention.

DEVELOPMENTS AT INTERNATIONAL LEVEL

- Countries are now being increasingly concerned about the entire issue pertaining to cyber security, as cyber security impacts not only the economy but also the sovereignty of nations.

- There is no international framework on cyber security and countries are increasingly taking it upon themselves to come up with their own national legislations to deal with cyber security breaches.

CHINESE NEW LAW ON CYBER SECURITY – EFFECTIVE 1ST JUNE, 2017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China

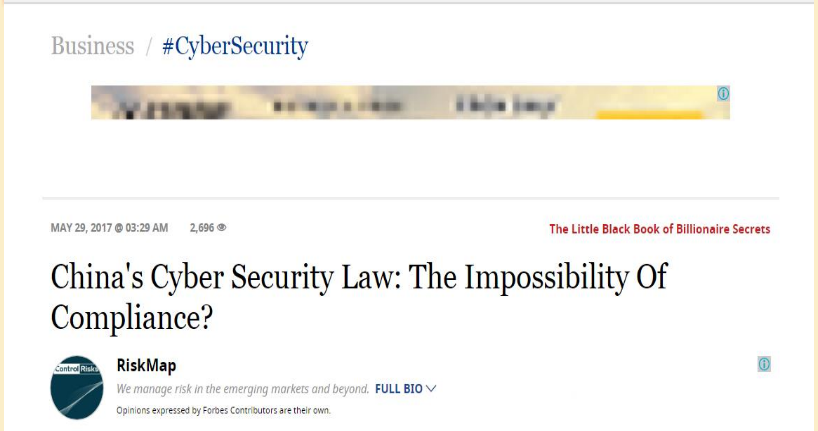
China passes new national security law extending control over internet

Officials say increasingly severe national security situation necessitates the law, which has wide-ranging powers but few exact details

Agence France-Presse in Beijing

Wednesday 1 July 2015 12.25 BST

www.theguardian.com/world/2015/jul/01/china-national-security-law-internet-regulation-cyberspace-xi-jinping#img-1



MAY 29, 2017 @ 03:29 AM 2,696

The Little Black Book of Billionaire Secrets

China's Cyber Security Law: The Impossibility Of Compliance?

RiskMap

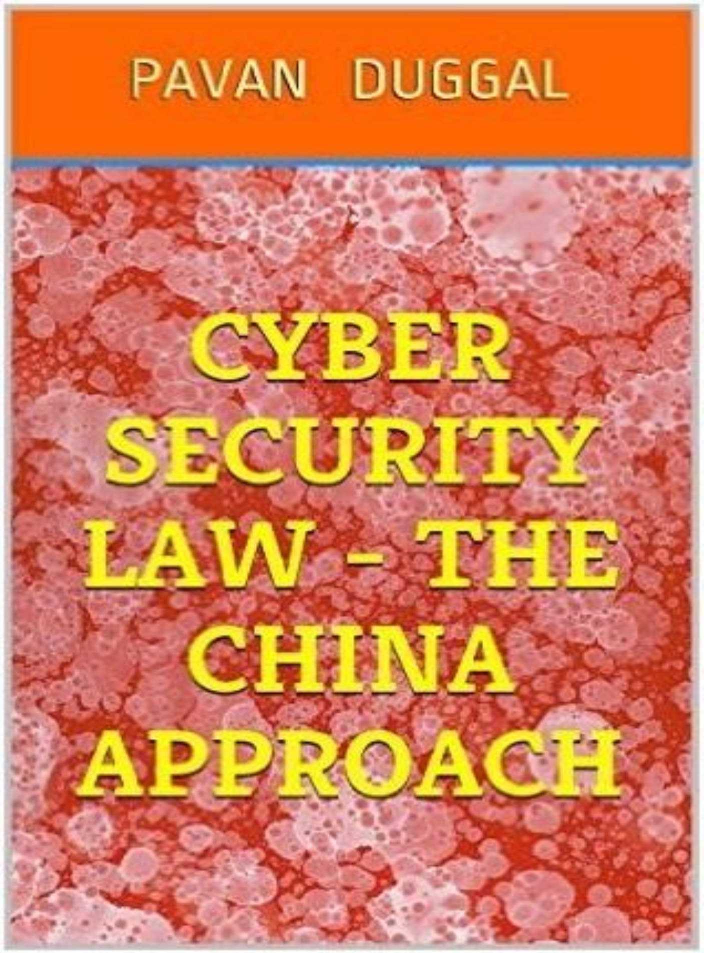
We manage risk in the emerging markets and beyond.

Opinions expressed by Forbes Contributors are their own.

❑The first thing to note about the new Chinese law is that it lays emphasis on cyber security aspects. A perusal of the salient features of the said legislation shows that China has adopted a distinctive approach of mingling cyber security within the broader ambit of national security.

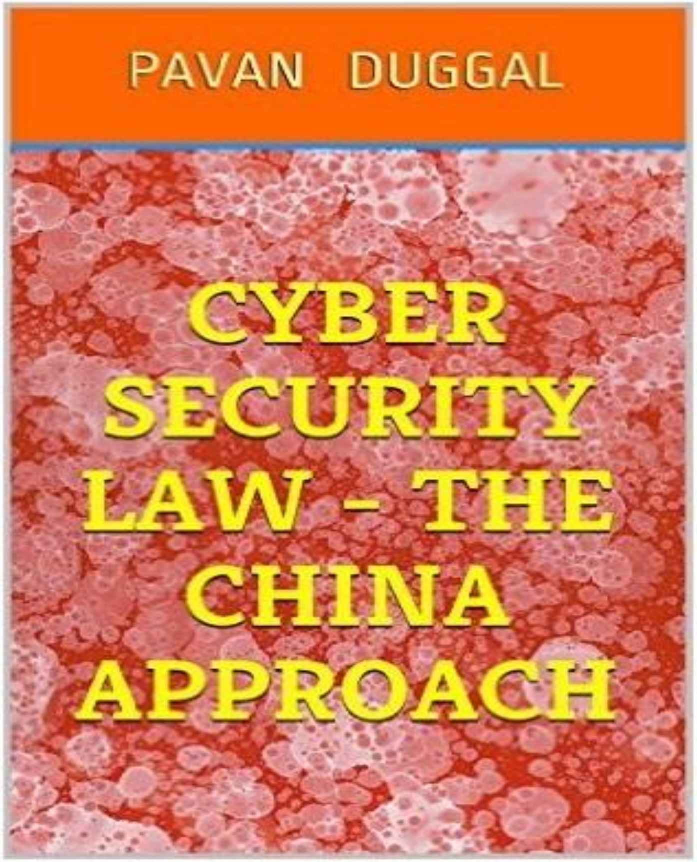
CHINESE APPROACHES ON CYBER SECURITY LAW

❑The way the provisions of the said law has been drafted are so wide to include within their ambit all kinds of cyber security breaches as any cyber security breach is going to influence national security, social stability as also prejudicial impact the preservation of public safety and societal tranquility.



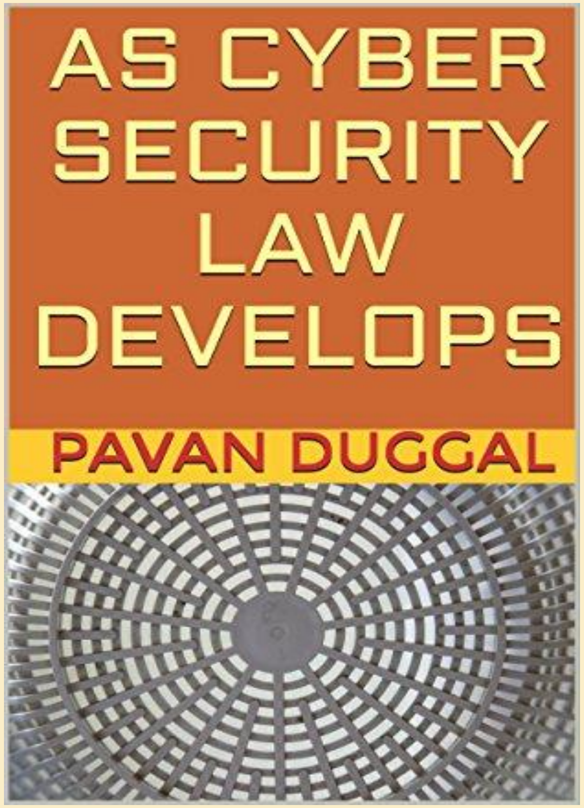
CHINESE CYBERSECURITY LAW COVERING OUTERSPACE

- The law says "security" must be maintained in all fields, from culture to education to cyberspace.
- Law is wide in scope adding, for instance, that security must be defended on international seabeds, in the polar regions and even in outer space.



CHINESE CYBERSECURITY LAW COVERING OUTERSPACE

- The new law also expands Beijing's security reach over China's tightly controlled Internet, maritime and polar interests, and even outer space:
- It declares both cyberspace and outer space to be part of China's national security interest, along with the ocean depths and polar regions.



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CHINESE CMS ON CYBER SECURITY AND OUTER SPACE

- **Chinese CMS on Cybersecurity and Outer Space**

- The Chinese Ministry of National Defense recently released its first-ever white paper on military strategy. “China’s Military Strategy” (abbreviated “CMS” for readability) outlines a strategy of “active defense” and emphasizes China’s commitment to “winning informationized local wars” and becoming a maritime power.

CHINESE CMS ON CYBER SECURITY AND OUTER SPACE

- China seeks to advance and defend its "cyber sovereignty" from perceived threats at home and abroad.
- Although the explicit discussion of China's cyber strategy in CMS is limited, what is stated is nonetheless significant.

CHINESE CMS ON CYBER SECURITY AND OUTER SPACE

- ❑ CMS characterizes outer space and cyberspace as the “new commanding heights in strategic competition among all parties,” and notes that, as war evolves towards “informatization” (xinxihua), China faces serious new security challenges.
- ❑ Threats from such new security domains as outer space and cyber space will be dealt with to maintain the common security of the world community.
- ❑ Therefore, a key strategic task of China’s armed forces is safeguarding China’s security interests in these new domains.

GROWING THREATS IN OUTER SPACE

- ❑ The vulnerability of satellites and other space assets to cyberattack
- ❑ Lack of appropriate discussions of cyberthreats to critical national infrastructure.
- ❑ This is a significant failing, given society's substantial and ever increasing reliance on satellite technologies for navigation, communications, remote sensing, monitoring and the myriad associated applications.

GROWING THREATS IN OUTERSPACE

- ❑ Analysing the intersection between cyber and space security is essential to understanding this non-traditional, evolving security threat.
- ❑ Cybersecurity and space security are inextricably linked.
- ❑ And the upgrades via remote connections could serve to make space assets vulnerable to cyberattacks.

GROWING THREATS IN OUTERSPACE

- ❑ Hackers, who represent the front end of the threat, currently constitute a major problem;
- ❑ In addition, the huge amount of data disseminated through satellites makes it possible for criminals to corrupt accuracy and reliability with a low probability of discovery.

GROWING THREATS IN OUTERSPACE

- In the maritime arena, space-based monitoring systems are regularly being jammed or spoofed by vessel operators entering false information in order to disguise their illicit activities. The need for integrity checks applies to many other aspects of the maritime domain such as distress calls, data and information.
- counter-space offensive cyber operations are now an integral part of its overall defence policy.

SPACE CYBER SECURITY REGIME- DIMENSIONS

- First, whatever is done to combat space cyber *in*security, policy should be adopted and applied in order to *enable* legitimate users of space-related capability, while increasing the costs (of entry, for example, or discovery and being subject to law enforcement action) for illegitimate users.
- Second, the governance of space cybersecurity needs a collective approach, involving as many legitimate stakeholders as possible and practical
- Third, the regime needs to be based on a self-governing and lightly regulated effort by a wide range of legitimate users of space capability.

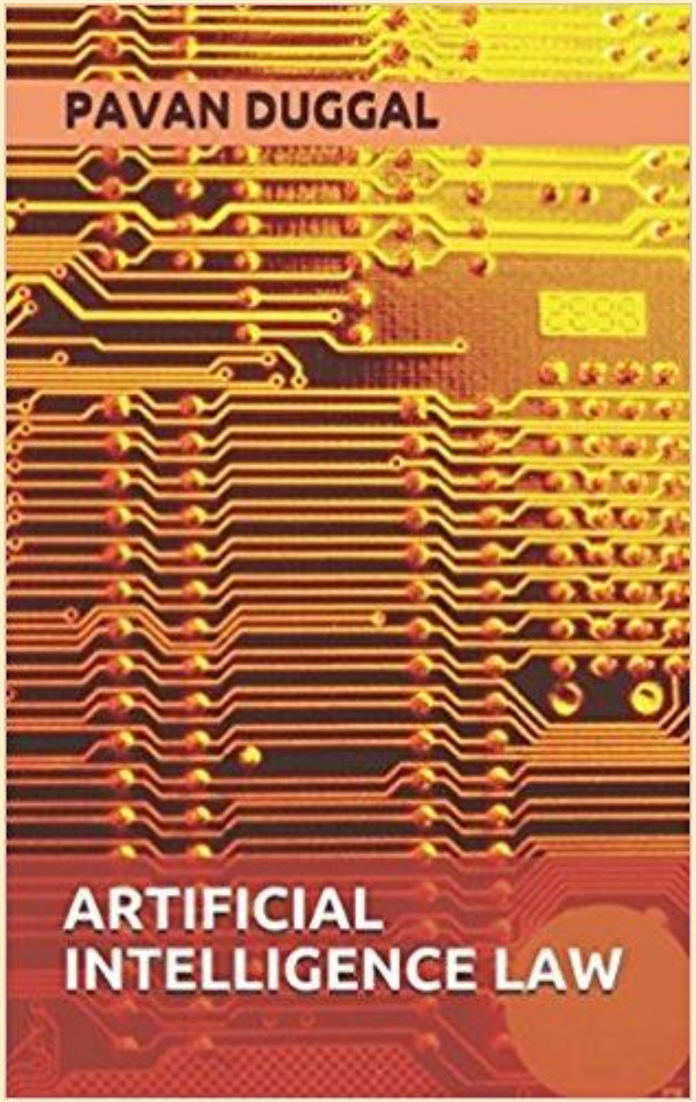
CYBERSECURITY IN OUTER SPACE

- Analyzing the intersection between cyber security and space security is essential to understanding this evolving problem.
- Need for an organized global effort to confront these threats. Despite some progress at the United Nations (UNOOSA) and elsewhere, there is currently no international body dedicated to the issue of cyber security in space.
- Establishing such a multi-stakeholder regime, with the aim of assessing risks and promoting best practices, would begin to close this critical gap.

NATURE OF THE THREAT

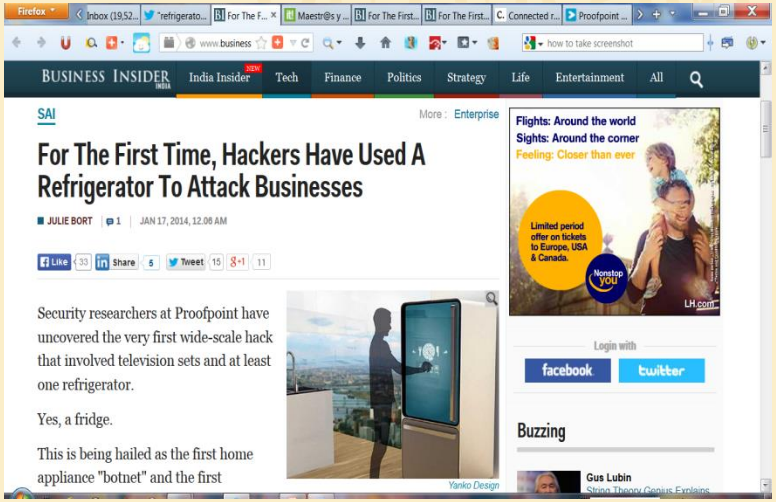
- Space and cyber guidelines are currently being discussed within the UN's Committee on Peaceful Uses of Outer Space to protect "foreign space objects" from "unauthorized access to their on-board hardware and software" and to "ensure the safety and security of terrestrial infrastructure that supports the operation of orbital systems and respect the security of foreign space-related terrestrial and information infrastructures."

ARTIFICIAL INTELLIGENCE



INTERNET OF THINGS- A NEW PARADIGM

INTERNET OF THINGS (IOT) AND OUTER SPACE CHALLENGES



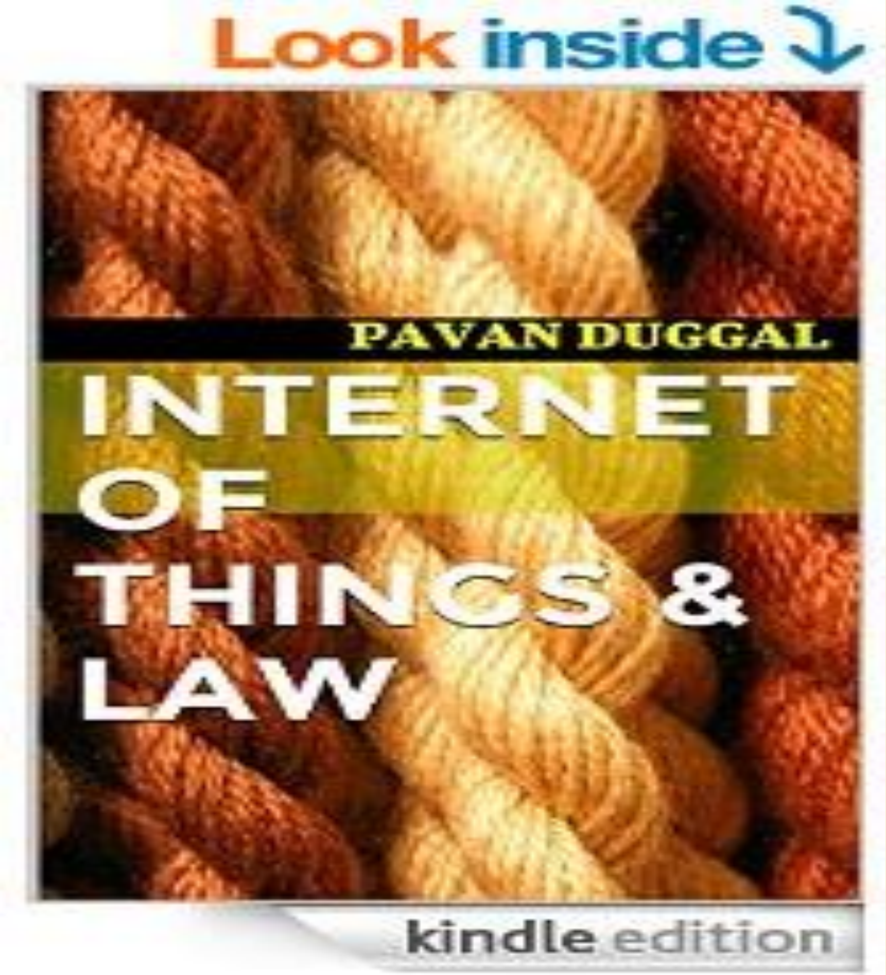
For The First Time, Hackers Have Used A Refrigerator To Attack Businesses

JULIE BORT | 1 | JAN 17, 2014, 12.08 AM

Security researchers at Proofpoint have uncovered the very first wide-scale hack that involved television sets and at least one refrigerator.

Yes, a fridge.

This is being hailed as the first home appliance "botnet" and the first

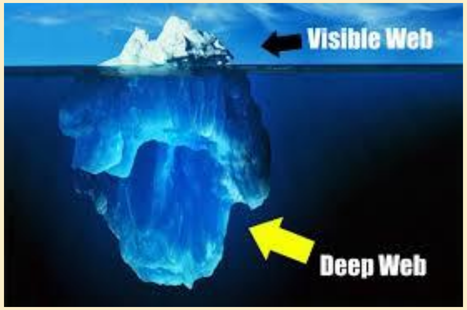


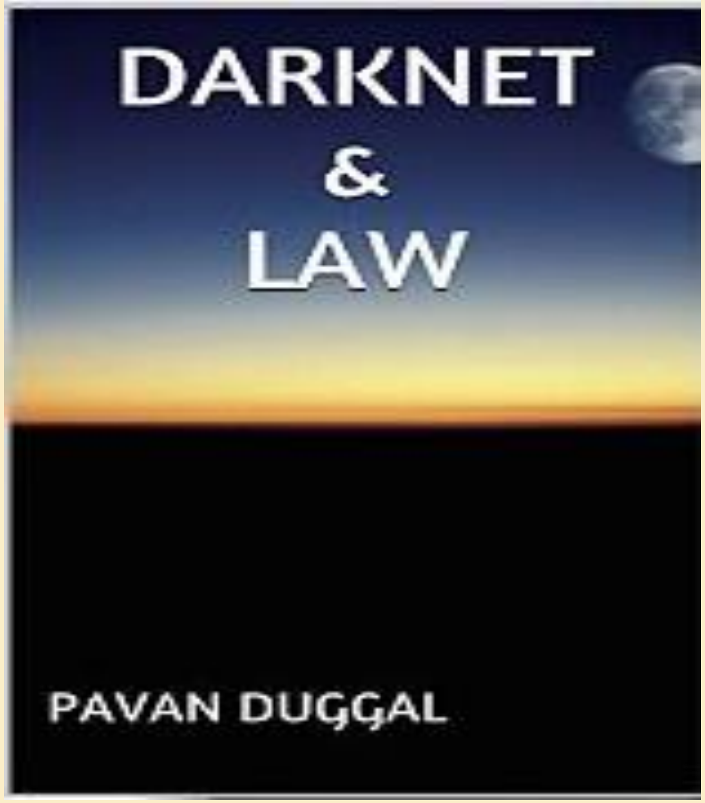
PAVAN DUGGAL

INTERNET OF THINGS & LAW

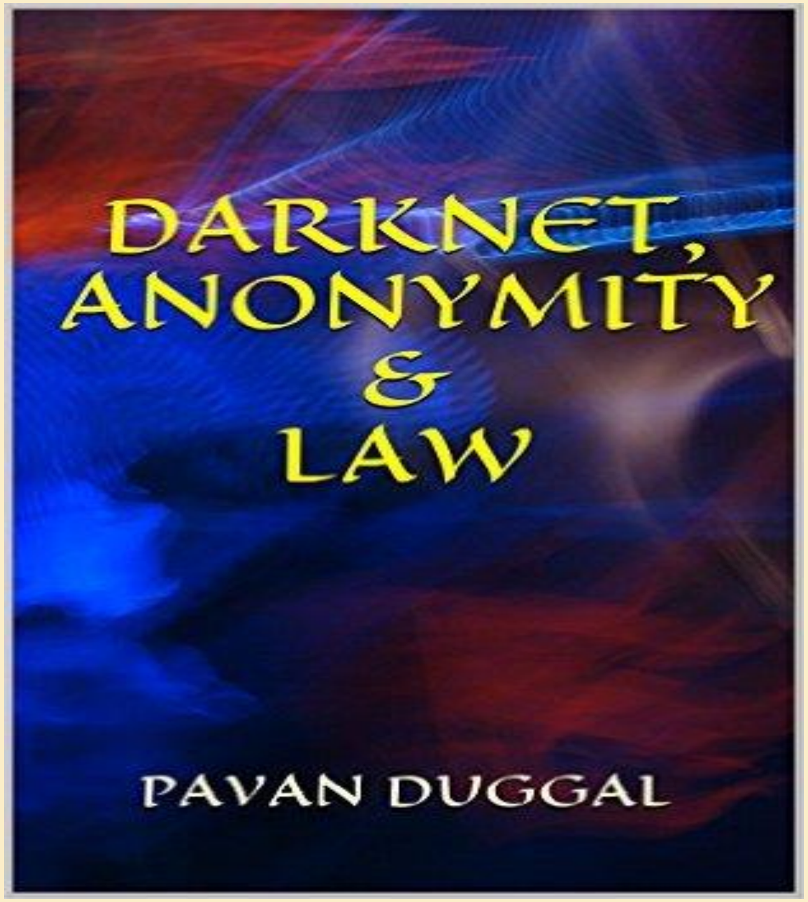
DARK WEB & OUTER SPACE

- Dark web is a new reality. However, the law-enforcement agencies and legal regimes are thoroughly incapable of dealing with dark web.
- Emerging challenge will relate to Use of Dark Net for cybercrime activities, targeted at Outer Space



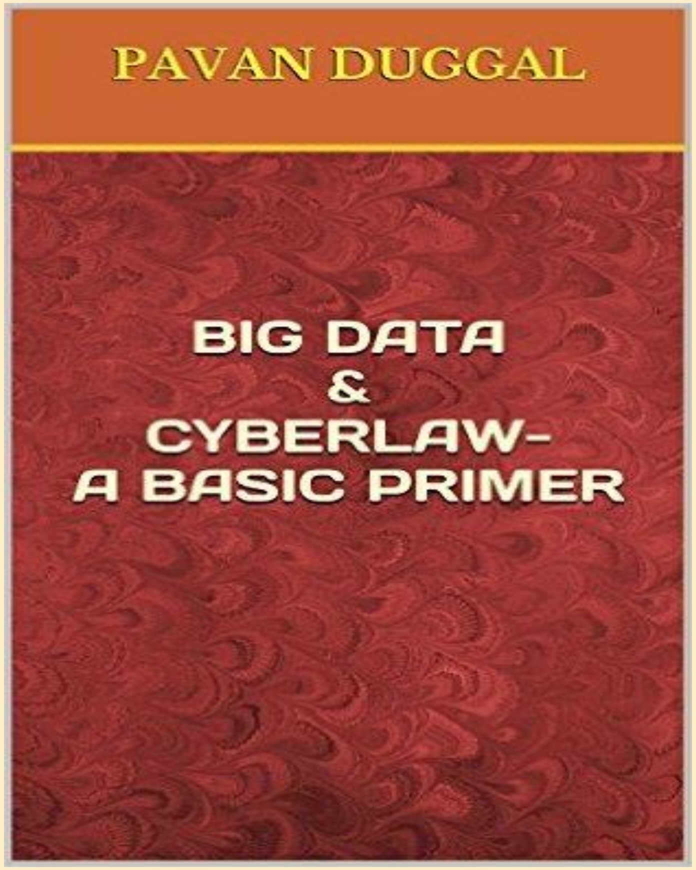


NEW THREATS TO OUTER SPACE


DARKNET,
ANONYMITY
&
LAW

PAVAN DUGGAL

CYBERCRIME AS A SERVICE & BIG DATA CHALLENGES FOR OUTER SPACE



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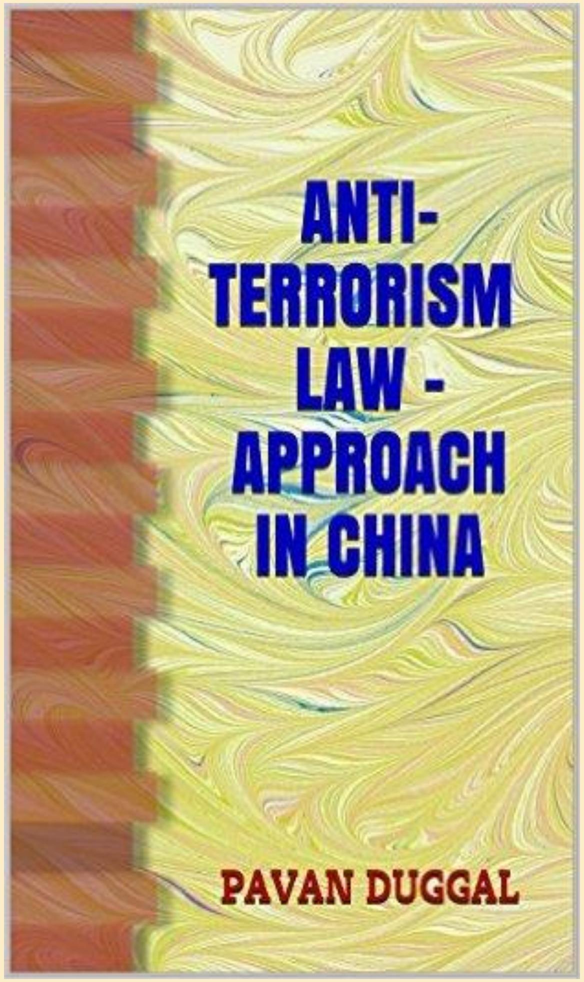
BIG DATA
&
CYBERLAW-
A BASIC PRIMER

CYBER TERRORISM TO TARGET OUTER SPACE???

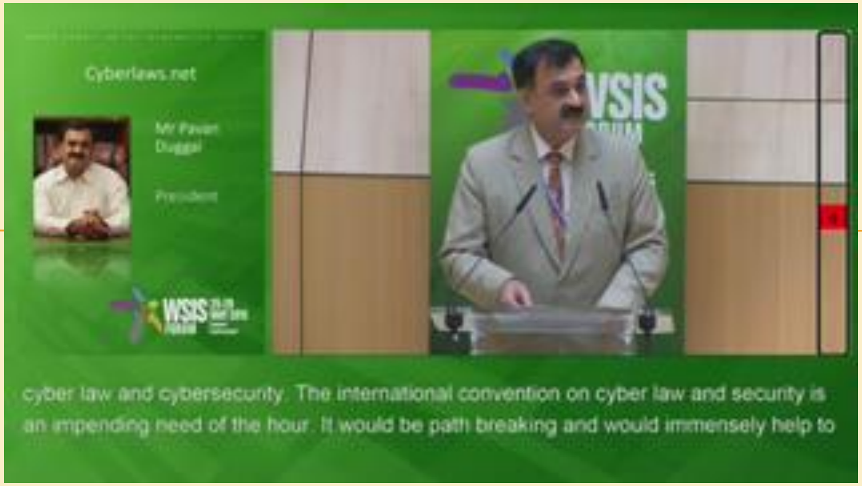


ANTI-TERRORISM LAW - APPROACH IN CHINA

PAVAN DUGGAL

INTERNATIONAL CONVENTION ON CYBERLAW & CYBERSECURITY RECOMMENDED

- ❑Need for coming up with an International Convention on Cyberlaw & Cyber Security.
- ❑Recommended during the High-Level Policy Statement delivered by me at the World Summit on Information Society (WSIS) organized by the International Telecommunications Union (ITU), UNESCO, UNCTAD & UNDP in Geneva, May, 2015.



cyber law and cybersecurity. The international convention on cyber law and security is an impending need of the hour. It would be path breaking and would immensely help to

INTERNATIONAL COMMISSION ON CYBER SECURITY LAW

INTERNATIONAL CONFERENCE ON CYBERLAW, CYBERCRIME & #CYBER SECURITY – 16TH & 17TH NOVEMBER, 2017, NEW DELHI, INDIA

Cyberlaws.Net & Pavan Duggal Associates
Present
INTERNATIONAL CONFERENCE ON
CYBERLAW,
CYBERCRIME & CYBERSECURITY

- The International Conference on Cyberlaw, Cybercrime & Cyber Security (www.cyberlawcybercrime.com) has provided the platform to discuss about emerging Cyberlaw, Cybercrime and Cybersecurity trends.

WAY GOING FORWARD

- There is a policy needed to establish a space cybersecurity regime which should align the needs of all the various concerns.
- a common approach to cybersecurity can be developed and encouraged by applying the principles of governance, management and inclusiveness
- A culture of space cybersecurity must lead to the development of an innate instinct for what is safe and what is risky throughout the supply chain.

CYBER LEGAL FRAMEWORKS FOR CYBER SECURITY IN OUTER SPACE

- Need for the development of an international, multi-stakeholder regime that would include industry, governmental, international, and nongovernmental organizations focused on cyber security in space
- We could work with UNOOSA for development of cyber legal frameworks impacting cyber security in Outer Space.

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