Lecture Notes in Networks and Systems

Volume 738

The series "Lecture Notes in Networks and Systems" publishes the latest developments in Networks and Systems—quickly, informally and with high quality. Original research reported in proceedings and post-proceedings represents the core of LNNS.

Volumes published in LNNS embrace all aspects and subfields of, as well as new challenges in, Networks and Systems.

The series contains proceedings and edited volumes in systems and networks, spanning the areas of Cyber-Physical Systems, Autonomous Systems, Sensor Networks, Control Systems, Energy Systems, Automotive Systems, Biological Systems, Vehicular Networking and Connected Vehicles, Aerospace Systems, Automation, Manufacturing, Smart Grids, Nonlinear Systems, Power Systems, Robotics, Social Systems, Economic Systems and other. Of particular value to both the contributors and the readership are the short publication timeframe and the world-wide distribution and exposure which enable both a wide and rapid dissemination of research output.

The series covers the theory, applications, and perspectives on the state of the art and future developments relevant to systems and networks, decision making, control, complex processes and related areas, as embedded in the fields of interdisciplinary and applied sciences, engineering, computer science, physics, economics, social, and life sciences, as well as the paradigms and methodologies behind them.

Indexed by SCOPUS, INSPEC, WTI Frankfurt eG, zbMATH, SCImago.

All books published in the series are submitted for consideration in Web of Science.

For proposals from Asia please contact Aninda Bose (aninda.bose@springer.com).

Jyotsna Kumar Mandal · Biswapati Jana ·
Tzu-Chuen Lu · Debashis De
Editors

Proceedings of International Conference on Network Security and Blockchain Technology

ICNSBT 2023

Springer

Editors
Jyotsna Kumar Mandal
Department of Computer Science
and Engineering
Kalyani University
Kalyani, West Bengal, India

Raiganj University
Raiganj, West Bengal, India

Tzu-Chuen Lu
Department of Information Management
Chaoyang University of Technology
Taichung, Taiwan

Biswapati Jana
Department of Computer Science
Vidyasagar University
Midnapore, West Bengal, India

Debashis De
Department of Computer Science
and Engineering
Maulana Abul Kalam Azad University
of Technology
Kolkata, West Bengal, India

ISSN 2367-3370 ISSN 2367-3389 (electronic)
Lecture Notes in Networks and Systems
ISBN 978-981-99-4432-3 ISBN 978-981-99-4433-0 (eBook)
https://doi.org/10.1007/978-981-99-4433-0

Foreword

Since the days of the Greek empire, steganography has existed in a variety of ways. Steganography itself derives from the Greek words steganos which represents concealed or covered and graphia means to write something. The Greek historian Herodotus wrote about how a slave served as the conduit for secret communication. After shaving the slave's head and tattooing the message on the exposed skull, the hair was then permitted to grow back. The slave was delivered to the recipient of the message, who shaved the slave's head to disclose the contents. The communication was definitely not time-sensitive! As a scout for the British during the Boer War, Lord Robert Baden-Powell marked the locations of Boer artillery sites by incorporating maps into drawings of butterflies. Anonymization, for example, may be construed to be a result of such a steganographic approach toward data.

Materials can be classified into identifiable and non-identifiable categories based on their identifiability. Information is created by adding value to data, which are facts and claims. Applications may not be linear, but data is jokingly said to be the smallest building block of information. Informally, the following formula can be used to distinguish between information and data: The phrase "you provided me with valuable information" is often used because information plus value equals data. As a result, value is created in the part that transforms data into information, which can be bought and sold.

A name cannot be unique as it is open to be adopted by one and all. That is why, a name is never bought or sold, i.e., transacted against consideration. While that very name, when laced with other attributes making it unique, creates value. The following depiction will give a clear idea. It is becoming more and more crucial for individuals and organizations to be able to send and receive data anonymously over the Internet in a time when much of the information sent over the Internet is stored and analyzed by various companies, governments, and online criminals. It has also become crucial for individuals and organizations to be able to conceal their locations. An adversary can determine the location or even the identity of the individual behind the communication by knowing the sender's or receiver's original IP address.

The encryption had always served to safeguard the confidentiality between the sender and the intended recipient. To add a stronger layer of protection to the hidden data, steganography methods are now being used more frequently in addition to cryptography. This study addressed how to embed a message into a JPEG image by controlling JPEG quantization tables, and it demonstrated how the quality factor in a JPEG image can be an embedding space (QTs). This method can be utilized as a permutation algorithm combination.

Of course, using social networks which are conducting their *lossless data transfers* over these networks cannot be guaranteed due to internal picture compression. Nevertheless, these social networks can be used to distribute connections to amusing pictures on other websites. Websites that offer visitors original (undisturbed) media material may be the best candidates for using it as a channel for steganography data flows. It is often concluded that there should be a way to either check all incoming and outgoing Internet traffic (check for steganographic data on a firewall, proxy, etc.) or to directly check Internet traffic at workplaces in a web browser. A corporate web browser might be the best option to avoid steganographic data flow.

The common name in the first slot is a valueless fact, while it acquires value when laced with a mobile number because it becomes unique. Lastly, adding another unique attribute viz. AADHAR, etc. will make it invaluable. Sharing one's name is an etiquette while sharing identifiable information that creates unique attributes is frightening. Therefore, a casual share of data can become a devastating disclosure of identity. Thus, information is classified into personally identifiable information and sensitive personally identifiable information.

The empty locker is the one that does not need a lock. Otherwise, nothing of value is contained there. Similar to this, if information loses any of its valuable qualities, it loses all of its value. There is no need for a lock or encryption. Otherwise, the likelihood of losing the information decreases significantly if it is shared or known because of a need or necessity. A piece of information is typically collected for promotion, verification, and identification purposes. Until one discloses other characteristics, such as a residence or an organization they are a member of, their name does not identify them. Second, one's identity can be verified before accessing some restricted services thanks to unique identity proof like AADHAR, etc. Everyone has the right to know why being identified, the limits of identification, and the authority of the identifier. These three correlate to one's fundamental right of privacy enshrined in MY INFORMATION—MY RIGHT and RIGHT TO BE FORGOTTEN.

Documents for clinical trials can number in the thousands of pages. They are submitted for approval to regulatory agencies like the FDA. Clinical research organizations make the laborious effort of manually cleaning up the paperwork to make sure that these documents do not contain the participants' private information.

Privacy AI shortens the turnaround time from days to hours by employing an automated process that includes entity detection, extraction, relationship management, and anonymization.

There is a definitive role for steganography in security. It is meant to support cryptography rather than supplant it. Steganography techniques lessen the likelihood that communication will be picked up. However, if that communication is also encrypted, it must also be decrypted if it is found (yet another layer of protection). Applications for steganography are virtually limitless. A very small portion of the field of steganography is covered in this essay. It involves much more than just including words in an image. In addition to digital images, steganography also applies to other types of files (such as voice, text, and binary ones) as well as other types of media like contact channels.

The road ahead lies in technological intervention involving steganographic cryptography and/or other methods, coupled with process reform and it is called Data Anonymiser. Anonymiser is a strainer that strains attributable data from personally identifiable information making it lose value but not loses context. It is neither just redacting nor masking of data. Because both redacting and masking processes are retractable. Anonymiser can be an application, a process, or a hybrid of both. For example, a person keys in one's login credentials oblivious to the CCTV behind one's back. It is clear that the feed stored via that CCTV has the person's SPII, and using that, the person's privacy can easily be violated. How to avoid that? The answer could be repositioning that CCTV. But is it possible on the fly? No. The simplest solution is to reposition the person himself. Similarly, Anonymiser could be a process reform too. Hence, a single Anonymiser may not be the solution for various problem statements. There could be many Anonymiser Solutions.

The State Government of West Bengal in the Department of Information Technology and Electronics has rolled out the Anonymiser hackathon through which any individual can contribute to the ever-growing repository of problem statements via Ideathon and thereafter come together to solve each of such problem statements by innovative methods comprising the application, process reforms et al which will be known as the Anonymiser. These solutions will then be taken through the live transactional data reposited with the government to find out whether they can really strain the valuable attributes laced in the PII/SPII and create an anonymised data lake.

Various market study suggests that the anonymized data has a market value of $ 220 Billion in 2021 that will grow to a whopping $ 343 Billion in 2030, and the tons of data generated by public services on a daily basis in this country could be a game changer for the academia, industry as well as the professionals. They will create affordable and accessible solutions for the mass. The 2nd ICNSBT 2023 is one

of the platforms that brings academicians, researchers, technological students, and industry people with common interests and interact issues and innovations relating to the information and system security, cryptographic issues, and blockchain.

Sanjay Kumar Das
West Bengal Civil Service (Exe.,'96)
Joint Secretary and State Information
Security Officer
IT&E Department
State Information Security
Government of West Bengal
Kolkata, West Bengal, India

Preface

This ICNSBT 2023 is focused on network security, privacy, and blockchain technology and its applications. The conference was held during March 25–26, 2023, at the Vidyasagar University, West Bengal, India. This volume consists of the privacy, authentication, digital watermarking, cyber-security, access control, security modeling, security in social networks, digital rights management, blockchain in the Internet of things (IoT), blockchain in cyber-physical systems, blockchain in social networking, blockchain in supply chain management, and cryptocurrency.

This volume contains a total of 44 distinct chapters authored by various researchers worldwide. This volume contains the research articles which are classified into three thrust areas, such as security and privacy, network security and its applications, and blockchain technology and IoT.

The first part "Security and Privacy" consists of the nineteen (19) research articles, contributed by the allied researchers, principally illustrates the machine learning-based identification of DDoS flood attack, phishing E-mail detection, improvement of a mutual authentication, collision avoidance and drowsiness detection of vehicles, face mask detection using CNN, and finds out the IoT-DDoS attack.

The second part "Network Security and Its Applications" consists of nine (09) articles mainly focused on the classification of brute-force attacks using CNN, malware analysis, asymptotic diffusion analysis, enhancement of data security for cloud computing, and increases the network security using genetic algorithm.

The third part "Blockchain Technology and IoT" consists of sixteen (16) original research articles and typically highlights the food supply chain for IoT, development of IoT-based biometric attendance system, protecting the privacy of IoMT, blockchain-based crowdfunding platform, and blockchain-based transparent solution for achieving investment for farming.

The conference received articles from more than ten countries with more than ten foreign authors. We are grateful to the Springer Nature for publishing the accepted and presented original research papers of ICNSBT 2023 in the "Lecture Notes in Networks and Systems" (LNNS), Springer Nature. On behalf of the organizing committee, we are grateful to the inaugurators, keynote presenters, and eminent experts who delivered the expert talks. Our sincere gratitude to the esteemed authors

and reviewers for extending support and cooperation. Hope this volume will be a valuable document for the researchers and budding engineers.

Raiganj/Kalyani, India — Jyotsna Kumar Mandal
Midnapore, India — Biswapati Jana
Taichung, Taiwan — Tzu-Chuen Lu
Kolkata, India — Debashis De

Contents

Network Security and Its Applications

Blockchain Technology and IoT

Editors and Contributors

About the Editors

Jyotsna Kumar Mandal completed M.Tech. (Computer Science, University of Calcutta) and Ph.D. (Engg., Jadavpur University) in the field of Data Compression and Error Correction Techniques and is Professor of Computer Science and Engineering, University of Kalyani, India; Former Director, IQAC, Kalyani University; Life Member of CSI, CRSI; Associate Member ACM, IEEE; Fellow Member of IETE; Former Dean Faculty of Engineering, Technology and Management, working in the field of Network Security, Steganography, Remote Sensing and GIS Application, and Image Processing; 35 years of teaching and research experiences; twenty-eight scholars were awarded Ph.D., four submitted, and eight are pursuing; the total number of publications is more than four hundred in addition of publication of twelve books from LAP Lambert, Germany, and IGI Global; organized 55 conferences of Springer Nature, Elsevier, IEEE, etc.; edited more than 55 proceedings as corresponding editor/editors; Member of NAAC Peer Team and AICTE Expert Team of EVC; Academic auditor for universities and institutes; delivered more than 100 expert lectures across the globe; Former Member of Governing Council, IETE, Delhi; and received Siksha Ratna Award from Government of West Bengal for outstanding performance of teaching and research.

Biswapati Jana completed M.Tech. (Computer Science and Engineering, University of Calcutta) and Ph.D. (Computer Science, Vidyasagar University) in the field of Data Hiding Techniques; Associate Professor in Computer Science, Vidyasagar University, India; 20 years of teaching and research experiences; four scholars awarded Ph.D. and six are pursuing; the total number of publications is more than hundred; and delivered more than 25 expert lectures across the globe. He served as Reviewer for a good number of international journals and conferences. His research interest includes Data Hiding, Image Processing, Data Security, Steganography, and Watermarking.

Tzu-Chuen Lu received the B.M. degree (1999) and MSIM degree (2001) in Information Management from Chaoyang University of Technology, Taiwan. She received her Ph.D. degree (2006) in Computer Engineering from National Chung Cheng University. Her current title is Professor in Department of Information Management at Chaoyang University of Technology.

Debashis De is Professor in Department of Computer Science and Engineering at Maulana Abul Kalam Azad University of Technology, West Bengal, India. He received M.Tech. from the University of Calcutta, 2002, and a Ph.D. from Jadavpur University in 2005. He is Senior Member, IEEE; Fellow, IETE; and Life Member, CSI. He was awarded the prestigious Boyscast Fellowship by the Department of Science and Technology, Government of India, to work at the Heriot-Watt University, Scotland, UK. He received the Endeavour Fellowship Award from 2008–2009 by DEST Australia to work at the University of Western Australia. He received the Young Scientist Award both in 2005 at New Delhi and in 2011 in Istanbul, Turkey, from the International Union of Radio Science, Belgium. In 2016, he received the J. C. Bose Research Award by IETE, New Delhi. In 2019, he received Shiksha Ratna Award by the Government of West Bengal. He established the Center of Mobile Cloud Computing (CMCC) for IoT applications. He is Vice Chair of Dew Computing STC of IEEE Computer Society. He published in 320 journals and 200 conference papers, fifteen books, and filed ten patents. His h-index is 36; citation 6300; and listed in Top 2% Scientist List of the world, Stanford University, USA. His research interest is Cloud, IoT, and Quantum Computing.

Contributors

Subhajit Adhikari Assistant Professor, BSH Department, Institute of Engineering and Management, University of Engineering and Management, Kolkata, India;
Research Scholar, Department of Computer Science, University of Burdwan, Burdwan, India

C. Ambika Department of Mathematics, Ethiraj College for Women, Chennai, India

Fatima Mohammad Amin Vellore Institute of Technology, Vellore, India

N. Anitha Head-Talent Development, 1.Ms.N.Anitha, Head-TalPixelExpert Technology & Services Pvt. Ltd., Chennai, India

S. Anitha Department of Information Technology, Kongu Engineering College, Erode, Tamilnadu, India

O. N. Arunkumar Symbiosis Centre for Management Studies (SCMS), Symbiosis International (Deemed University) (SIU), Bengaluru, Karantaka, India;
Symbiosis Institute of Business Management (SIBM), Bengaluru, India

N. Ashok Department of Information Technology, Kongu Engineering College, Erode, Tamilnadu, India

Arpan Baiagi Department of Computer Science, Ramakrishna Mission Residential College, Narendrapur, Calcutta University, Kolkata, India

B. Balamurugan Velammal Institute of Technology, Chennai, Tamilnadu, India

Siddhartha Banerjee Department of Computer Science, Ramakrishna Mission Residential College, Narendrapur, Calcutta University, Kolkata, India

Arkojeet Bera National Institute of Technology Karnataka, Surathkal, Mangalore, Karnataka, India

Debkumar Bera Department of Computer Science, Vidyasagar University, West Midnapore, West Bengal, India

Rahul Deb Bhandari Department of Computer Science, Ramakrishna Mission Residential College, Narendrapur, Calcutta University, Kolkata, India

K. Bharadwaj Department of CSE, SCSVMV (Deemed to be University), Tamilnadu, India

Medhavi Bhargava School of Engineering and Technology, SAGE University, Bhopal, India

Debnandan Bhattacharyya Department of Electronics and Communication Engineering, St. Thomas' College of Engineering and Technology, Kolkata, India

Srikakulapu Bhavitha Department of Information Technology, Velagapudi Ramakrishna Siddhartha Engineering College, Vijayawada, Andhra Pradesh, India

Snehal Bhosale Department of E&TC, Symbiosis Institute of Technology (SIT), Symbiosis International (Deemed University) (SIU), Lavale, Pune, Maharashtra, India

Swarup Kumar Bhunia Department of Commerce, Rishi Bankim Chandra Evening College affiliated to West Bengal State University, Naihati, West Bengal, India

Anindya Bose Department of Computational Science, Brainware University, Calcutta, West Bengal, India

Aratrik Bose Computer Science and Engineering, Dr. B.C. Roy Engineering College, Durgapur, West Bengal, India

Rajesh Bose Department of Computational Science, Brainware University, Calcutta, West Bengal, India

Sourav Kr. Burnwal Department of Electronics and Communication Engineering, St. Thomas' College of Engineering and Technology, Kolkata, India

Mebanphira Cajee Department of Computer Science and Engineering, Symbiosis Institute of Technology (SIT), Symbiosis International (Deemed University) (SIU), Lavale, Pune, Maharashtra, India

Kunal Chakate Department of Computer Science and Engineering, Symbiosis Institute of Technology (SIT), Symbiosis International (Deemed University) (SIU), Lavale, Pune, Maharashtra, India

Subhalaxmi Chakraborty University of Engineering and Management, Kolkata, India

V. Chandrasekaran Department of Medical Electronics, Velalar College of Engineering and Technology, Erode, Tamilnadu, India

Kamlesh Chandravanshi School of Computing Science and Engineering, VIT Bhopal University, Sehore, Madhya Pradesh, India

K. S. Chandru Department of CSBS, Bannari Amman Institute of Technology, Sathyamangalam, India

Vinaykumar Chikaraddi Department of BCA, BLDEA's A.S. Patil College of Commerce (Autonomous), Vijayapura, India

Vishwanath Chikkareddi B.L.D.E.A's V.P. Dr. P.G. Halakatti College of Engineering and Technology, Vijayapura, India

Santosh Chinchali B.L.D.E.A's V.P. Dr. P.G. Halakatti College of Engineering and Technology, Vijayapura, India

Ayushya Chitransh DL Unify, DLT Labs, Hyderabad, India

Pravir Chitre Galgotias University, Greater Noida, UP, India;
Bhai Parmanand DSEU Shakarpur Campus II, Galgotias University, Delhi, India

Sahil Chorghe Sardar Patel Institute of Technology, Mumbai, India

Partha Chowdhuri Department of Computer Science, Vidyasagar University, WB, India

Ananya Roy Chowdhury Bangladesh Army International University of Science and Technology, Cumilla, Bangladesh

Prasun Chowdhury Department of Electronics and Communication Engineering, St. Thomas' College of Engineering and Technology, Kolkata, India

T. Daranya Department of Information Technology, Kongu Engineering College, Erode, Tamilnadu, India

Puja Das Department of Computer Science, HMM College for Women, Dakshineswar, Kolkata, India

Rajarshi Das University of Engineering and Management, Kolkata, India

Ritaban Das Department of Electronics and Communication Engineering, St. Thomas' College of Engineering and Technology, Kolkata, India

Asish Debnath Vidyasagar University, Midnapore, West Bengal, India

S. Deepika School of Computer Science and Engineering, Vellore Institute of Technology, Chennai, India

Ashis Dey Department of Computer Science, Silda Chandra Sekhar College, WB, India

Keval Dhanani Sardar Patel Institute of Technology, Mumbai, India

Rajesh Dhumal Symbiosis Institute of Geoinformatics (SIG), Symbiosis International (Deemed University) (SIU), Pune, Maharashtra, India

D. Divya Symbiosis Centre for Management Studies (SCMS), Symbiosis International (Deemed University) (SIU), Bengaluru, Karantaka, India

Saraswati Dutta Department of Mathematics, Midnapore College [Aotonomus], Midnapore, West Bengal, India

Jyotsna Gaikwad Deogiri College, Aurangabad, Maharashtra, India

Sonali Gaikwad Shree Shivaji Science and Arts College, Chikhli, Maharashtra, India

V. Geetha Department of CSE, SCSVMV (Deemed to be University), Tamilnadu, India

Bibek Ranjan Ghosh Department of Computer Science, Ramakrishna Mission Residential College, Narendrapur, Calcutta University, Kolkata, India

Nandana Ghosh Department of Computer Science, Vidyasagar University, Midnapore, West Bengal, India

Ritam Ghosh ACM Student Member, Kolkata, India

Subha Ghosh University of Engineering and Management, Kolkata, India

Debasis Giri Department of Information Technology, Maulana Abul Kalam Azad University of Technology, Kolkata, West Bengal, India

Govinda Giri Department of Computer Science and Engineering, Symbiosis Institute of Technology (SIT), Symbiosis International (Deemed University) (SIU), Lavale, Pune, Maharashtra, India

Anand Godbole Sardar Patel Institute of Technology, Mumbai, India

C. K. Gomathy Department of CSE, SCSVMV (Deemed to be University), Tamilnadu, India

Deepsubhra Guha Roy IEM Centre of Excellence for Cloud Computing and IoT, Department of CSE (AIML), Institute of Engineering and Management, Kolkata, India

Barnali Gupta Banik DL Unify, DLT Labs, Hyderabad, India

Alok Haldar Department of Computer Science, Kharagpur College, Kharagpur, West Bengal, India;
Department of Computer Science, Vidyasagar University, Midnapore, West Bengal, India

Amrita Haldar Department of Computer Science and Business Studies, IEM, Kolkata, India

Alok Halder Department of Computer Science, Khragpur College, West Midnapore, West Bengal, India

Nishat Tasnim Haque Bangladesh Army International University of Science and Technology, Cumilla, Bangladesh

Vemula Harish Jawaharlal Nehru TechnologicalUniversity, Hyderabad (JNTUH), Telangana, India

S. Hashwanth Vellore Institute of Technology, Chennai, India

Abhijeetsinh Jadeja Department of Computer Science, Shri C.J Patel College of Computer Studies (BCA), Sankalchand Patel University, Visnagar, India

Biswapati Jana Department of Computer Science, Vidyasagar University, West Midnapore, West Bengal, India;
Department of Computer Science, Kharagpur College, Kharagpur, West Bengal, India

Manasi Jana Department of Computer Applications, Haldia Institute of Technology, Haldia, West Bengal, India

Sharmistha Jana Department of Mathematics, Midnapore College [Autonomous], Midnapore, West Bengal, India

Shubhankar Joardar Department of Computer Science and Engineering, Haldia Institute of Technology, Haldia, West Bengal, India

Anshuman Kalla Department of Computer Engineering, CGPIT, Uka Tarsadia University, Bardoli, Gujarat, India

M. Kameswari Kalasalingam Academy of Research and Education, Chennai, Tamilnadu, India

Soumen Kanrar Amity University, Jharkhand, India;
Vlenzor Technologies Pvt. Ltd., Kolkata, India

Priyanshu Kapadia Department of Computer Engineering, CGPIT, Uka Tarsadia University, Bardoli, Gujarat, India

Sunil Karforma Dean(Science) Faculty, Department of Computer Science, The University of Burdwan, Burdwan, India

Parag Ravikant Kaveri Symbiosis Institute of Computer Studies and Research, Symbiosis International (Deemed University), Pune, India

Pooja Khanna Amity University Uttar Pradesh, Lucknow, India

S. Kirthica Department of Computer Science and Engineering, College of Engineering Guindy, Anna University, Chennai, India

Sonali Kothari Department of Computer Science and Engineering, Symbiosis Institute of Technology (SIT), Symbiosis International (Deemed University) (SIU), Lavale, Pune, Maharashtra, India

S. Kranthi Department of Information Technology, Velagapudi Ramakrishna Siddhartha Engineering College, Vijayawada, Andhra Pradesh, India

Srinivasan Krishnaswamy Indian Institute of Technology Guwahati, Assam, India

Pankaj Kumar Srinivasa Ramanujan Department of Mathematics, Central University of Himachal Pradesh, Dharamshala, H.P., India

Sachin Kumar Amity University Uttar Pradesh, Lucknow, India

Kousik Kundu Department of Mathematics, Midnapore College [Aotonomus], Midnapore, West Bengal, India

Pritam Kundu University of Engineering and Management, Kolkata, India

Sumana Kundu Computer Science and Engineering, Dr. B.C. Roy Engineering College, Durgapur, West Bengal, India

Nilesh Kunhare School of Computing Science and Engineering, VIT Bhopal University, Sehore, Madhya Pradesh, India

Chidanand Kusur B.L.D.E.A's V.P. Dr. P.G. Halakatti College of Engineering and Technology, Vijayapura, India

Prathamesh Vijay Lahande Symbiosis Institute of Computer Studies and Research, Symbiosis International (Deemed University), Pune, India

G. Lakshman Department of CSE, SCSVMV (Deemed to be University), Tamilnadu, India

Tzu Chuen Lu Department of Information Management, Chaoyang University of Technology, Taichung, Taiwan, ROC

A. Uma Maheswari PG & Research Department of Mathematics, Quaid-E-Millath Government College for Women (Autonomous), Chennai, India

Soumyadip Maity Ramakrishna Mission Vidyamandira, Howrah, West Bengal, India

Anandaprova Majumder Computer Science and Engineering, Dr. B.C. Roy Engineering College, Durgapur, West Bengal, India

Jyotsna Kumar Mandal Department of Computer Science and Engineering, Kalyani University, Kalyani, India

S. Maragathasundari Kalasalingam Academy of Research and Education, Chennai, Tamilnadu, India

Sudipta Meikap Department of Computer Science, Hijli College, Paschim Medinipur, West Bengal, India;
Department of Computer Science, Vidyasagar University, Midnapore, West Bengal, India

Raaj Anand Mishra Dell EMC, Bangalore, India

Pinaki Mitra Indian Institute of Technology Guwahati, Assam, India

Prachi Mohite Department of Computer Science and Engineering, Symbiosis Institute of Technology (SIT), Symbiosis International (Deemed University) (SIU), Lavale, Pune, Maharashtra, India

Uttam Kr. Mondal Vidyasagar University, Midnapore, West Bengal, India

Megh Naik Department of Computer Engineering, CGPIT, Uka Tarsadia University, Bardoli, Gujarat, India

B. Nandhini Department of Information Technology, Kongu Engineering College, Erode, Tamilnadu, India

Subrata Nandi Narula Institute of Technology, Agarpara, West Bengal, India;
Indian Institute of Technology Guwahati, Assam, India

Pabitra Pal Department of Computer Applications, Maulana Abul Kalam Azad University of Technology, Nadia, West Bengal, India

A. Pandiaraj Department of Computing Technologies, SRM Institute of Science and Technology, Chennai, India

Darshanaben Dipakkumar Pandya Department of Computer Science, Shri C.J Patel College of Computer Studies (BCA), Sankalchand Patel University, Visnagar, India

Chanchal Patra Department of Information Technology, Maulana Abul Kalam Azad University of Technology, Kolkata, West Bengal, India

Soumya Paul St. Mary's Technical Campus Kolkata, Barasat, West Bengal, India

Anil Audumbar Pise Department of Data Science and Machine Learning Computer Science, University of the Witwatersrand, Johannesburg, South Africa

Pragya MVD College, Lucknow, India

Asis Prasad Department of Electronics and Communication Engineering, St. Thomas' College of Engineering and Technology, Kolkata, India

Yogesh Rajput Symbiosis Institute of Geoinformatics (SIG), Symbiosis International (Deemed University) (SIU), Pune, Maharashtra, India

Dirun Reddy Department of Computer Science and Engineering, Symbiosis Institute of Technology (SIT), Symbiosis International (Deemed University) (SIU), Lavale, Pune, Maharashtra, India

Saha Reno Bangladesh Army International University of Science and Technology, Cumilla, Bangladesh

Sandip Roy Department of Computational Science, Brainware University, Calcutta, West Bengal, India

Satyabrata Roy Department of Computer Science and Engineering, Manipal University Jaipur, Jaipur, Rajasthan, India

Shovan Roy Department of Mathematics, Midnapore College [Aotonomus], Midnapore, West Bengal, India

Adapaka Sai Kishore Department of Information Technology, Velagapudi Ramakrishna Siddhartha Engineering College, Vijayawada, Andhra Pradesh, India

Nguyen Kim Sao Department of Computer Science, University of Transport and Communication, Hanoi, Vietnam

Piyush Sharma Srinivasa Ramanujan Department of Mathematics, Central University of Himachal Pradesh, Dharamshala, H.P., India

Rohan Shinde Sardar Patel Institute of Technology, Mumbai, India

Afrin Siddiqui Amity University Uttar Pradesh, Lucknow, India

Moutushi Singh Department of Information Technology, IEM, Kolkata, India

Prabhash Kumar Singh Department of Computer Science, Vidyasagar University, Midnapore, West Bengal, India

Debarpito Sinha Ramakrishna Mission Vidyamandira, Howrah, West Bengal, India

Gaurav Soni School of Computing Science and Engineering, VIT Bhopal University, Sehore, Madhya Pradesh, India

R. Sridevi Department of Computer Science and Engineering, JNTUH University College of Engineering, Science and Technology, Hyderabad, Telangana, India; Jawaharlal Nehru TechnologicalUniversity, Hyderabad (JNTUH), Telangana, India

Srinivasan Sriramulu Galgotias University, Greater Noida, UP, India

Vijayan Sugumaran School of Business Administration, Oakland University, Rochester, MI, USA

C. Swedheetha Vaigai College of Engineering, Madurai, Tamilnadu, India

T. C. Swetha Priya Department of Computer Science and Engineering, JNTUH University College of Engineering, Science and Technology, Hyderabad, Telangana, India

Zerin Tasnim Bangladesh Army International University of Science and Technology, Cumilla, Bangladesh

Garima Thakur Srinivasa Ramanujan Department of Mathematics, Central University of Himachal Pradesh, Dharamshala, H.P., India

Lu Tzu-Chuen Department of Information Management, Chaoyang University of Technology, Taichung, Taiwan, ROC

R. Vanalakshmi Kalasalingam Academy of Research and Education, Chennai, Tamilnadu, India

R. Venkatesan Department of IT, Bannari Amman Institute of Technology, Sathyamangalam, India

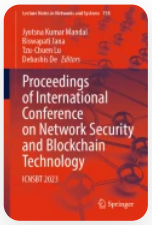
K. P. Vijayakumar School of Computer Science and Engineering, Vellore Institute of Technology, Chennai, India

G. Vimalsubramanian Department of CSE, Kalasalingam Academy of Research and Education, Srivilliputhur, India

Thanh Nhan Vo Department of Information Management, Chaoyang University of Technology, Taichung, Taiwan, R. O. C.

Malicious Transaction URL Detection Using Logistic Regression

| Conference paper | First Online: 29 November 2023
| pp 85–94 | Cite this conference paper



Proceedings of International Conference on Network Security and Blockchain Technology

(ICNSBT 2023)

Aratrik Bose, Anandaprova Majumder & Sumana Kundu

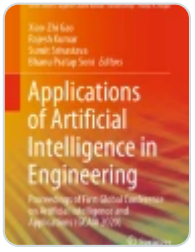
Part of the book series: Lecture Notes in Networks and Systems ((LNNS,volume 738))

Included in the following conference series:
International Conference on Network Security and Blockchain Technology

Abstract

The onset of COVID-19 has shifted people to the virtual world more to avoid social interaction. In fact, the trading systems have shifted to E-Commerce platforms which include virtual transactions as well. Besides being a boon, virtual transactions have also brought in several cybercrimes. Several fraudulent sites are created for distracting the users from authentic sites and lead them to the unsafe ones where users lose their personal data or even their wealth at worst cases. This paper is to illustrate a machine learning solution for putting a check on these kinds of activities. Different Python tools have been used to preprocess the dataset that contains different URLs which is classified into safe unsafe categories depending on the presence of SSL certificate or encryption of the URL which is further fed into a model that classifies URLs into safe and unsafe categories using logistic regression. Other than earlier approaches, our proposed model not only checks simple URLs but also check whether URLs are safe for transaction.

Similar content being viewed by others

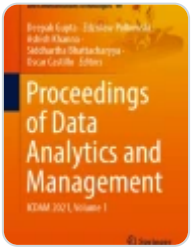


Data Mining Techniques for Fraud Detection—Credit Card Frauds

Chapter | © 2021

Machine learning techniques for anti-money laundering (AML) solutions in suspicious...

Article | 10 February 2018



AI-Driven Fraud Detection and Mitigation in e-Commerce Transactions

Chapter | © 2022

References

1. Bendovschi A (2015) Cyber-attacks—trends, patterns and security countermeasures. Procedia Econ Finan 28:24–31

Article Google Scholar

2. Digital commerce transactions. Report https://www.moneycontrol.com/news/business/banks/digital-commerce-transactions-increased-30-in-2021-but-so-are-digital-frauds-says-rbi-report-8256031.html

3. Karabatak M, Mustafa T (2018) Performance comparison of classifiers on reduced phishing website dataset. In: 2018 6th international symposium on digital forensic and security (ISDFS), pp 1–5

Google Scholar

4. Lakshmanarao A, Babu MR, Bala Krishna MM (2021) Malicious URL detection using NLP, machine learning and FLASK. In: 2021 international conference on innovative computing, intelligent communication and smart electrical systems (ICSES), pp 1–4

Google Scholar

5. Hevapathige A, Rathnayake K (2022) Super learner for malicious URL detection. In: 2022 2nd international conference on advanced research in computing (ICARC), pp 114–119

Google Scholar

6. Manyumwa T, Chapita PF, Wu H, Ji S (2020) Towards fighting cybercrime: malicious URL attack type detection using multiclass classification. In: 2020 IEEE international conference on big data (Big Data), pp 1813–1822

Google Scholar

7. Peng Z, He Y, Sun Z, Ni J, Niu B, Deng X (2022) Crafting text adversarial examples to attack the deep-learning-based malicious URL detection. In: ICC 2022—IEEE international conference on communications, pp 3118–3123

Google Scholar

8. Singh A, Roy PK (2021) Malicious URL detection using multilayer CNN. In: 2021 international conference on innovation and intelligence for informatics, computing, and technologies (3ICT), pp 340–345

Google Scholar

9. Ren F, Jiang Z, Liu J (2019) A bi-directional LSTM model with attention for malicious URL detection. In: 2019 IEEE 4th advanced information technology, electronic and automation control conference (IAEAC), pp 300–305

Google Scholar

10. Malware dataset. https://www.unb.ca/cic/datasets/url-2016.html

Author information

Authors and Affiliations

Computer Science and Engineering, Dr. B.C. Roy Engineering College, Durgapur, West Bengal, India
Aratrik Bose, Anandaprova Majumder & Sumana Kundu

Corresponding author

Correspondence to Aratrik Bose .

Editor information

Editors and Affiliations

Department of Computer Science and Engineering, Kalyani University, Kalyani, West Bengal, India

Jyotsna Kumar Mandal

Department of Computer Science, Vidyasagar University, Midnapore, West Bengal, India
Biswapati Jana

Department of Information Management, Chaoyang University of Technology, Taichung, Taiwan
Tzu-Chuen Lu

Department of Computer Science and Engineering, Maulana Abul Kalam Azad University of Technology, Kolkata, West Bengal, India
Debashis De

Rights and permissions

Copyright information

About this paper

Cite this paper

Bose, A., Majumder, A., Kundu, S. (2024). Malicious Transaction URL Detection Using Logistic Regression. In: Mandal, J.K., Jana, B., Lu, TC., De, D. (eds) Proceedings of International Conference on Network Security and Blockchain Technology. ICNSBT 2023. Lecture Notes in Networks and Systems, vol 738. Springer, Singapore. https://doi.org/10.1007/978-981-99-4433-0_8

DOI

Published
29 November 2023

Publisher Name
Springer, Singapore

https://doi.org/10.1007/978-981-99-4433-0_8

Print ISBN
978-981-99-4432-3

Online ISBN
978-981-99-4433-0

eBook Packages
Engineering
Engineering (R0)

Publish with us

Policies and ethics