# Criteria 3: Research, Innovation, Extension

## Key Indicator 3.3 Research Publication and Awards

### 3.3.3.1. Total number of books and chapters in edited volumes/books published and papers in national/ international conference proceedings year-wise during last five years

**DVV Query:** Provide Cover page, content page and first page of Lecture Notes in Networks and Systems book series (LNNS, volume 146) Smart Innovation, Systems and Technologies book series (SIST, volume 195) Conference Paper Advances in Intelligent Systems and Computing book series (AISC, volume 1174) Conference Paper Conference Paper Smart Innovation, Systems and Technologies book series (SIST, volume 196) Cognitive Engineering for Next Generation Computing: A Practical Analytical Approach Conference Paper Innovations in Computer Science and Engineering: Proceedings of 8th ICICSE Advances in Intelligent Systems and Computing book series (AISC, volume 1325) Conference Paper Lecture Notes in Networks and Systems book series (LNNS, volume 164) Conference Paper Conference Paper with ISBN numbers, title, author, Department/ School/ Division/ Centre/ Unit/ Cell, name and year of publication.

| S. No. | Name of the teacher | Department | Title of the paper and Proceeding | Year of publication | ISBN | Cover, Content and First page |
|---|---|---|---|---|---|---|
| 1 | Dr. Mrs. Gresha Bhatia | Computer Engineering | Harvest Treasure: Prediction of Best Crop Yield, Intelligent Computing and Networking, Lecture Notes in Networks and Systems book series (LNNS, volume 146) | 2020 | Print ISBN :978-981-15-7420-7<br>Online ISBN: 978-981-15-7421-4 | 4 |
| 2 | Mrs. Asha Bharambe | Information Technology Engineering | Secured Crowdfunding Platform using Blockchain, Intelligent Computing and Networking, Lecture Notes in Networks and Systems book series (LNNS, volume 146) | 2020 | Print ISBN :978-981-15-7420-7<br>Online ISBN: 978-981-15-7421-4 | 9 |

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|---|---|---|---|---|---|---|
| 3 | Dr. Mrs. Gresha Bhatia | Computer Engineering | Crop Prediction based on Environmental conditions and Disease Prediction, Information and Communication Technology for Intelligent Systems, Smart Innovation, Systems and Technologies book series (SIST, volume 195) | 2020 | Print ISBN: 978-981-15-7077-3<br>Online ISBN: 978-981-15-7078-0 | 14 |
| 4 | Mrs. Kajal Jewani | Computer Engineering | Smart Employment System: An HR Recruiter, Information and Communication Technology for Intelligent Systems, Smart Innovation, Systems and Technologies book series (SIST, volume 195) | 2020 | Print ISBN: 978-981-15-7077-3<br>Online ISBN: 978-981-15-7078-0 | 18 |
| 5 | Dr. Gresha Bhatia , Mrs.Abha Tewari | Computer Engineering | Extraction of Tabular data from PDF to CSV files, Advances in Intelligent Systems and Computing book series (AISC, volume 1174) | 2020 | Print ISBN:978-981-15-5615-9<br>Online ISBN: 978-981-15-5616-6 | 22 |
| 6 | Dr. Sharmila Sengupta | Computer Engineering | Named Entity Recognition for Rental Documents using NLP, Information and Communication Technology for Intelligent Systems, Smart Innovation, Systems and Technologies Volume 196(SIST, volume 196) | 2020 | Print ISBN: 978-981-15-7061-2<br>Online ISBN: 978-981-15-7062-9 | 27 |
| 7 | Mrs. Pallavi Saindane | Computer Engineering | Saathi – A smart IoT Based Pill Reminder for IVF Patients, Information and Communication Technology for Intelligent Systems, Smart Innovation, Systems and Technologies Volume 196(SIST, volume 196) | 2020 | Print ISBN: 978-981-15-7061-2<br>Online ISBN: 978-981-15-7062-9 | 31 |
| 8 | Mrs. Pallavi Saindane | Computer Engineering | sVana- The sound of silence, Information and Communication Technology for Intelligent Systems, Smart Innovation, Systems and Technologies Volume 196(SIST, volume 196) | 2020 | Print ISBN: 978-981-15-7061-2<br>Online ISBN: 978-981-15-7062-9 | 35 |
| 9 | Mrs. Lifna C. S | Computer Engineering | Coreveillance—Making Our World a “SAFER” Place, Information and Communication Technology for Intelligent Systems, Smart Innovation, Systems and Technologies Volume 196(SIST, volume 196) | 2020 | Print ISBN: 978-981-15-7061-2<br>Online ISBN: 978-981-15-7062-9 | 39 |

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|---|---|---|---|---|---|---|
| 10 | Dr. Mrs. Anjali yeole | Computer Engineering | Ensuring Security and Privacy in IoT for Healthcare Applications, Cognitive Engineering for Next Generation Computing: A Practical Analytical Approach | 2021 | Online ISBN: 9781119711308<br><br>Print ISBN: 9781119711087 | **43** |
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| 12 | Mrs. Priya R. L | Computer Engineering | Analyzing the Impact of Deforestation and Population on Carbon Footprint in Indian cities using Statistical and Deep Learning Techniques, Soft Computing and Signal Processing, Advances in Intelligent Systems and Computing book series (AISC, volume 1325) | 2021 | Print ISBN: 978-981-33-6911-5<br><br>Online ISBN: 978-981-33-6912-2 | **53** |
| 13 | Mrs. Priya R. L | Computer Engineering | Cataract Eye Detection using Machine Learning Models, Emerging Technologies in Data Mining and Information Security, Lecture Notes in Networks and Systems book series (LNNS, volume 164) | 2021 | Print ISBN: 978-981-15-9773-2<br><br>Online ISBN: 978-981-15-9774-9 | **57** |

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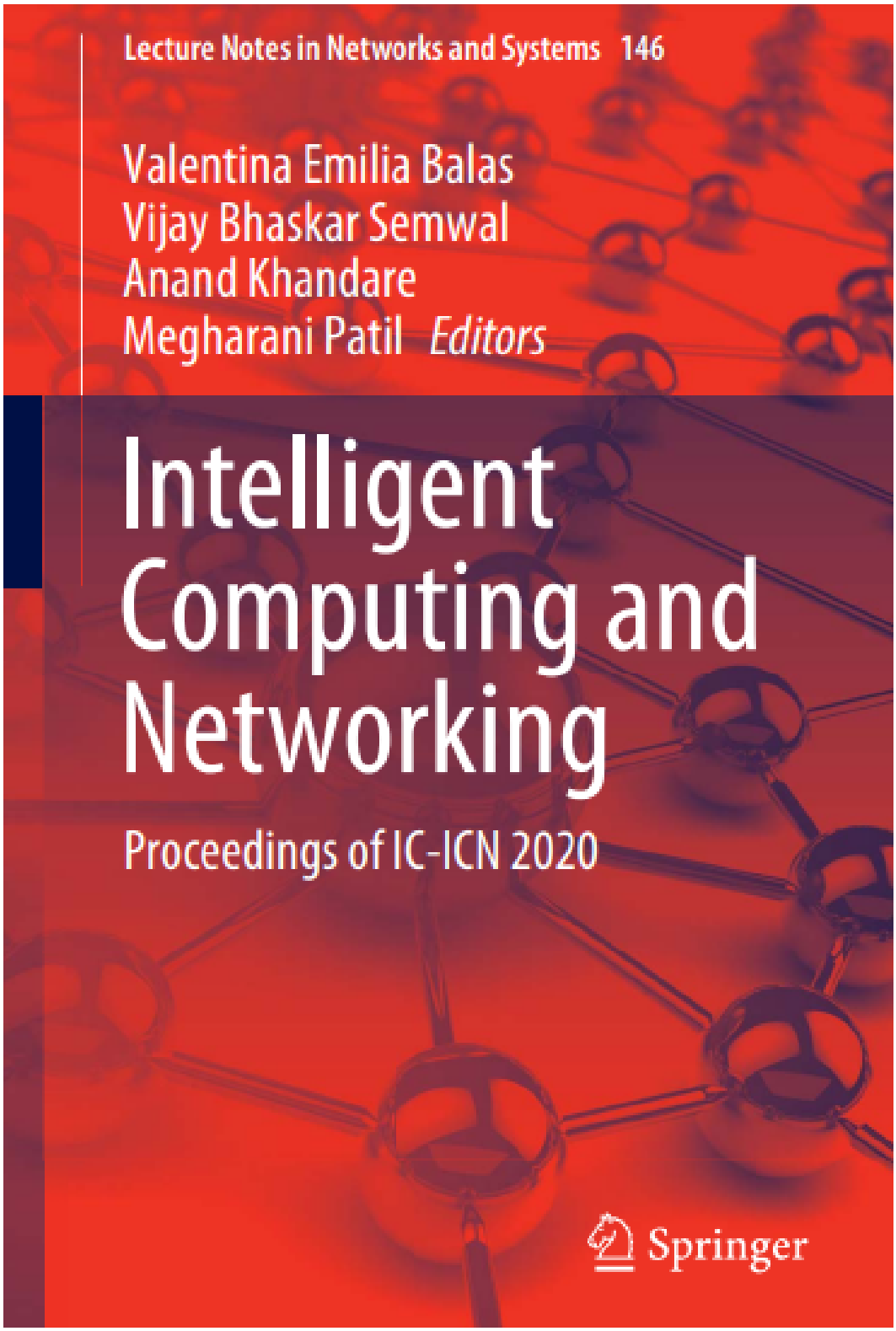

# Lecture Notes in Networks and Systems

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# Contents

# Harvest Treasure: Prediction of Best Crop Yield

**Gresha S. Bhatia, Simran Bhagwandasani, Rahul Bhatia, Urjita Bedekar, and Pranit Naik**

**Abstract** Agriculture is one of the most critical and essential occupations practiced in our country. It is an economic sector that plays an essential role in the overall development of the country. Thus, the modernization of agriculture is significant and thus will lead the farmers of our country toward profit. Earlier, the sowing of crops was performed by considering the farmer's knowledge in a particular field and about a specific crop. However, as the weather conditions change very rapidly, farmers cultivate more and more crops that do not give an expected yield, thereby reducing their profits. Being this as the current situation, many of them do not have enough knowledge about the new crops and are not entirely aware of the benefits they get while farming them. Also, farm productivity can be increased by understanding and forecasting crop performance in a variety of environmental conditions. The proposed system applies machine learning and prediction algorithms to identify the pattern among data and then process it as per input conditions. This in turn will propose the best feasible crops according to given environmental conditions. Thus, this system will only require the land area of the user, and it will suggest a number of profitable crops providing a choice directly to the farmer about which crop to cultivate. As past year production is also taken into account, the prediction will be more precise.

**Keywords** Machine learning · Yield prediction · Indian agriculture

## 1 Introduction

Agriculture in India has a full-size history. More than 60% of the land in the country is used for agriculture to cater to the needs of 1.2 billion people. India is ranked second worldwide in farm output. Agriculture and other sectors like forestry and fisheries accounted for 16.6% of GDP in 2009 [1, 2]. The production of crops relies on different factors like climatic and geographical. Accurate statistics about the character of an ancient yield of the crop is a critical modeling input, which is useful

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# Intelligent Computing and Networking

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# Contents

# Secured Crowdfunding Platform Using Blockchain

**Megha Sahu, Ashish Gangaramani, and Asha Bharambe**

**Abstract** Crowdfunding is a platform can be used to collect small amount from large number of people. In Traditional platform it is not easy to track the usage of the fund. Hence campaign creator can use money for their own need.This paper proposes a solution on how to prevent such fraud in crowdfunding platforms using blockchain and smart contracts. The main aim of this solution is to propose a solution that can reduce those effects. The important feature of Blockchain is that it maintains transparency among the nodes in the network. We are proposing a solution keeping this feature in mind to implement campaign as smart contracts designed for crowdfunding websites where campaign managers will need to get approval based for their requirements from backers. The proposed solution has been implemented using Ethereum and tested on Rinkeby Network.

**Keywords** Smart contract · Backer · Campaign · Campaign creator/manager · Rinkeby network · Metamask

## 1 Introduction

Crowdfunding is a method of collecting capital through the effort of friends, family, customers, and individual investors. Nowadays social media is our biggest tool of communication, crowdfunding and internet together can be great solution when you need some investment. When number of people sees potential in some idea or project, they can invest small amount and you can easily collect the target amount.

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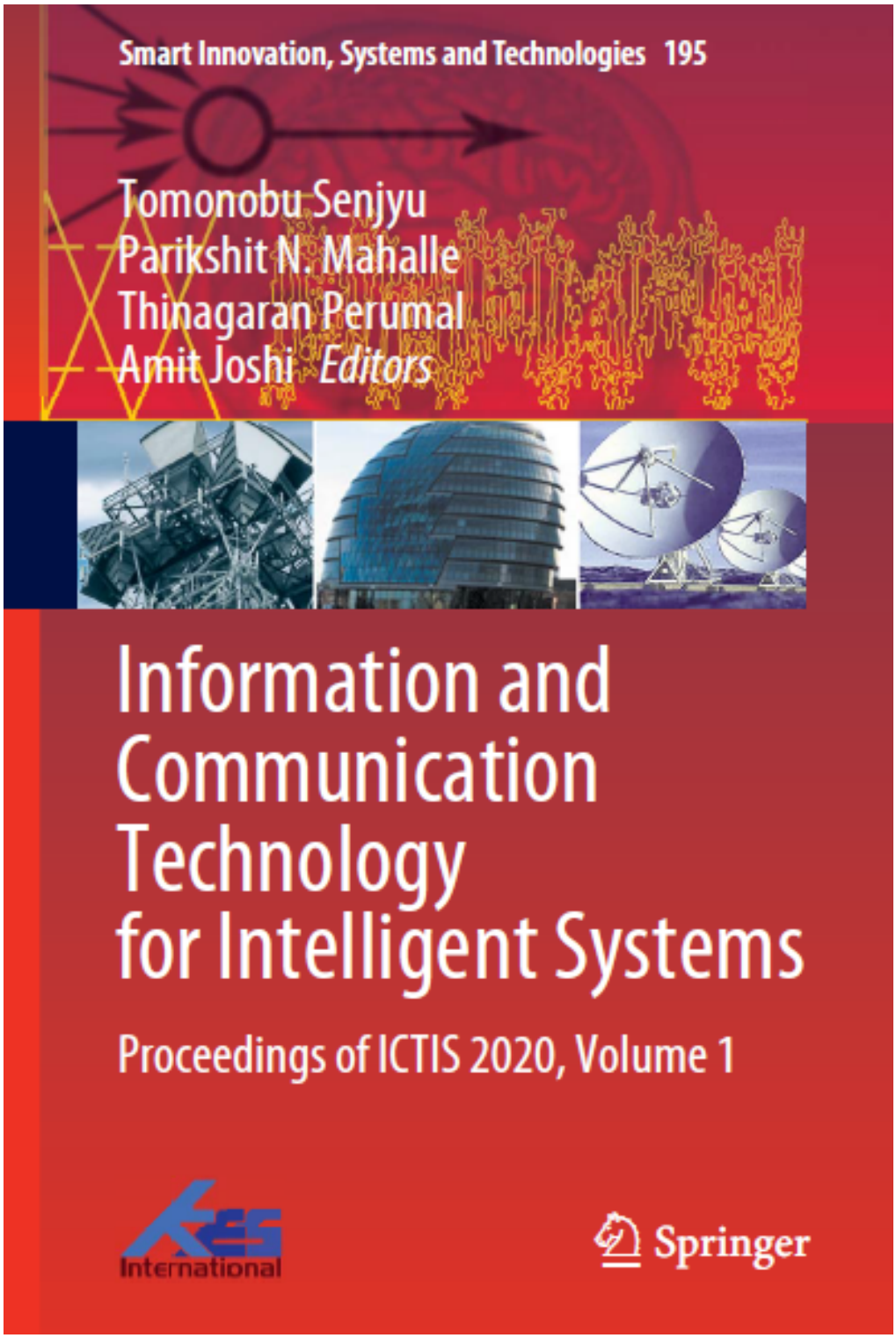

# Smart Innovation, Systems and Technologies

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# Crop Prediction Based on Environmental Conditions and Disease Prediction

**Gresha Bhatia, Nikhil Joshi, Srivatsan Iyengar, Sahil Rajpal, and Krish Mahadevan**

**Abstract** In the proposed system, we intend to use machine learning and deep learning algorithms to predict which crops can be grown on a particular field given its soil type, environmental conditions like rainfall, humidity, temperature and so on. We also wish to design a disease prediction model as an additional feature which helps the farmers to identify if their crops are suffering from any diseases. This will help the farmers to ensure that their crops stay healthy throughout their period of growth. Also if the crops are suffering from a disease, we would be able to detect that and suggest what must be done to cure the disease and avoid it in future. This would require data analytics, data warehousing techniques to be employed to prepare a good and appropriate data set to train the selected model. For interacting with the farmers, we would develop a Web portal so that the farmers can access our system and use it for himself/herself.

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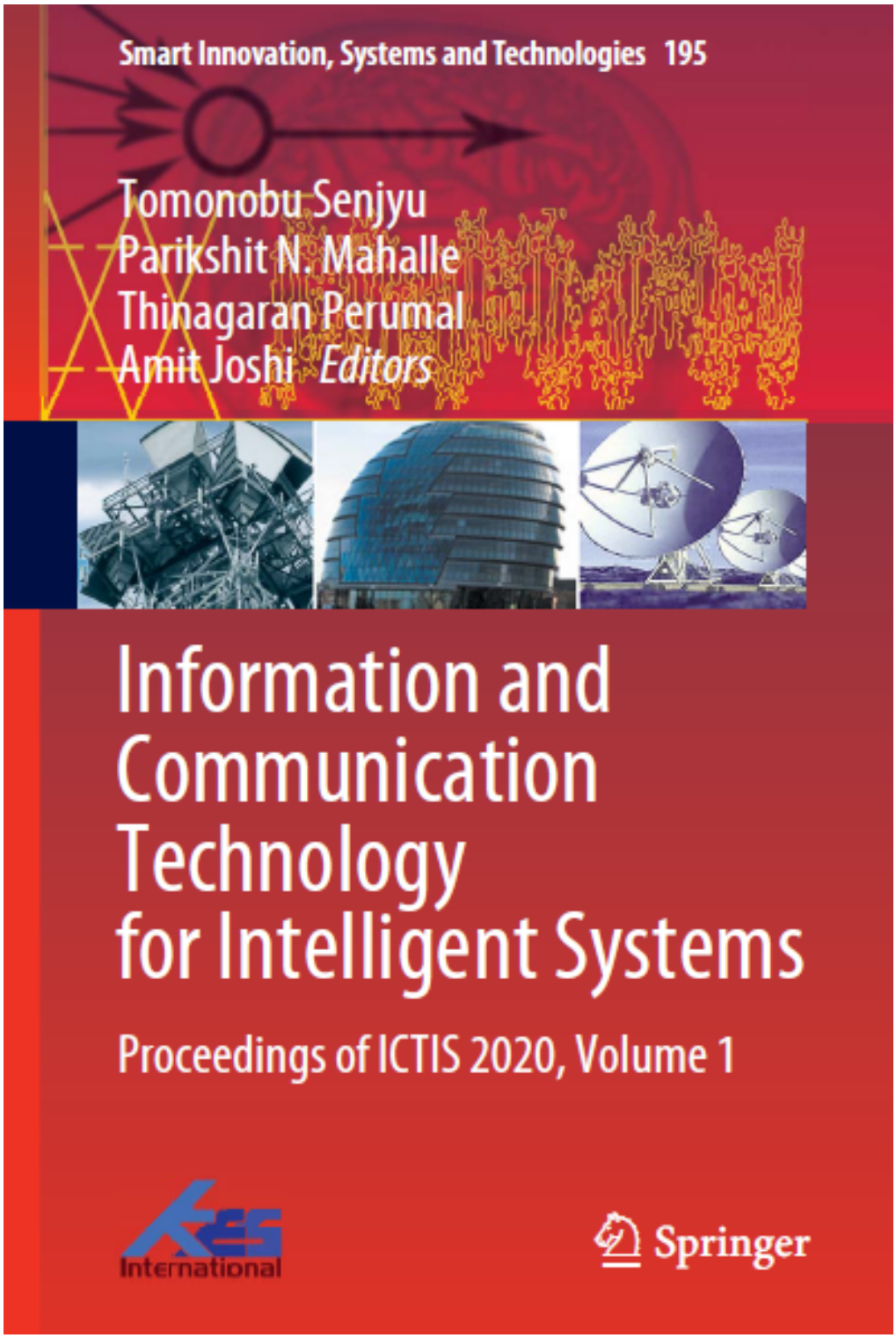

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# Smart Employment System: An HR Recruiter


**Kajal Jewani, Anupreet Bhuyar, Anisha Kaul, Chinmay Mahale, and Trupti Kamat**

**Abstract** The traditional HR recruitment process is long and time-consuming. The talent search process is restricted due to human limitations. The overwhelming number of candidates, geographical constraints and deception which cannot often be caught by experienced recruiters are some of the problems faced by the sector and there is an urgent need to address the concern with technical solutions. To optimize this entire process of HR interviews, we propose video analytics be used to screen candidates. A candidate's emotion is extracted from his speech using Mel-Frequency Cepstral Coefficients (MFCCs) as a major classification feature for the Artificial Neural Network (ANN). Deceptive Impression Management (IM), i.e. an applicant trying to exaggerate his suitability for a job by overestimating his prowess is also taken into consideration when displaying results. Thus, an NLP approach using Linguistic Inquiry and Word Count (LIWC) and Latent Dirichlet Allocation (LDA) is used for text-based measurement of deceptive IM which may help by informing organizations to take a second, more critical review of applicants when a high level of deceptive IM is detected. Finally, the Big five personalities index: Openness, Conscientiousness, Extroversion, Agreeableness, Neuroticism (OCEAN) commonly used by many recruiters, is digitized using Convoluted Neural Networks (CNN) and a personality graph generated, giving a more comprehensive view of the candidate's

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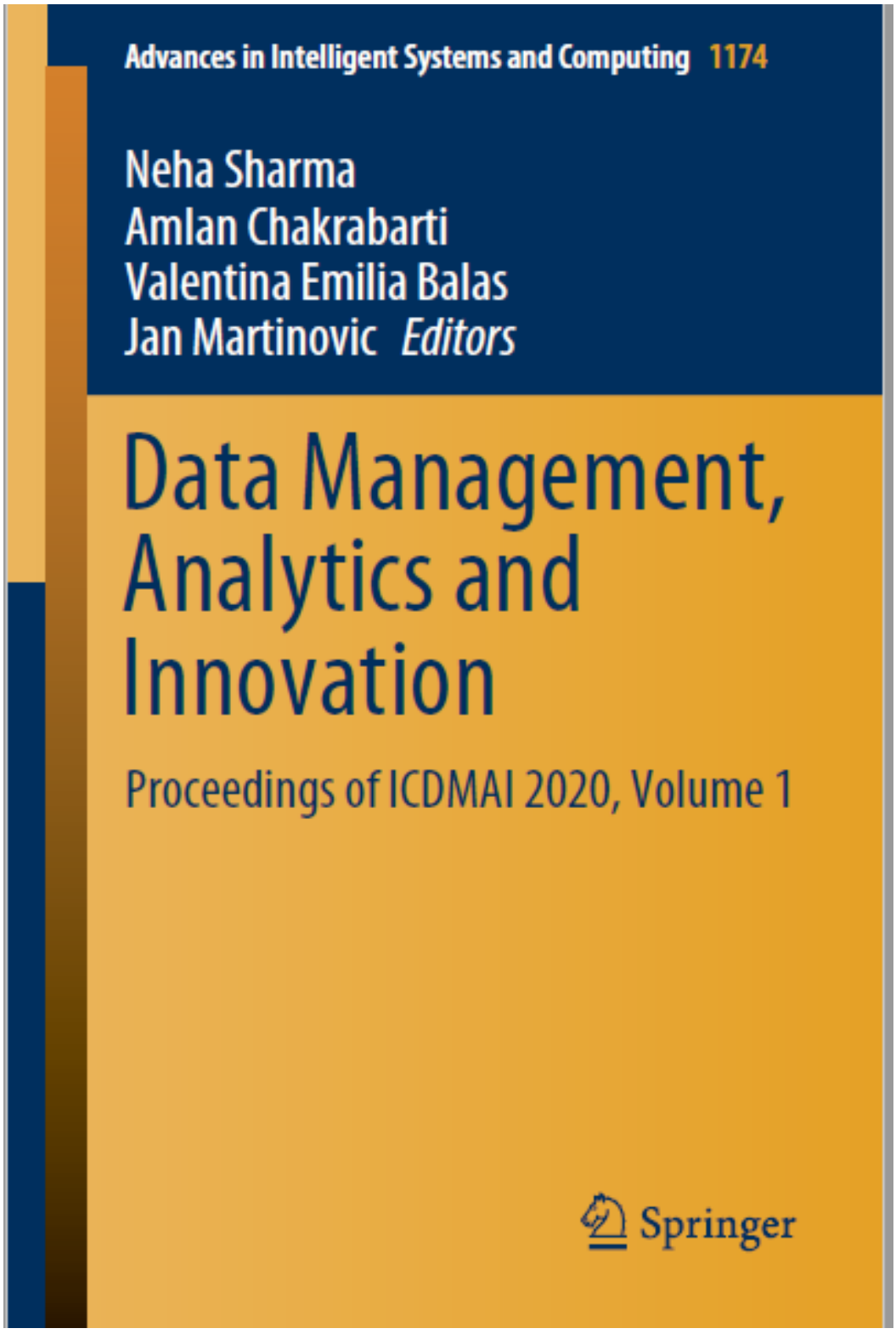

# Advances in Intelligent Systems and Computing

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# Extraction of Tabular Data from PDF to CSV Files

**Gresha Bhatia, Abha Tewari, Grishma Gurbani, Sanket Gokhale, Naman Varyomalani, Rishil Kirtikar, Yogita Bhatia, and Shefali Athavale**

**Abstract** Companies generate their reports in the form of PDF files. For further data analysis, the statistics or quantitative data in these reports have to be converted to CSV (.csv) or Excel (.xlsx) files. This is done manually by companies. This consumes a lot of time and manual work which can be reduced for better utilization of resources. Forecomp is a web application to automatically convert the tables in the PDF to CSV files. The tables could be present in text format or as an image. The web application is built keeping flexibility in mind such that the user can select the process used to convert the PDF into CSV files based on the tables in their PDF. Different technologies used in this application include YOLO model for machine learning, Tesseract OCR, Tabula, and an inbuilt snipping tool. This paper introduces the concepts behind Forecomp focussing on the methodology employed and the various results obtained.

**Keywords** Optical Character Recognition (OCR) · YOLO model · Machine learning · Comma-Separated Values (CSV) · Portable Document Format (PDF)

## 1 Introduction

A table is a collection of data held in a table format. It is an arrangement of information in rows and columns containing cells. We know that a large amount of data is generated every day, and our main goal is to extract information from this data. This information can be very crucial for a company. Many times this data is represented in the form of tables. Thus, it becomes an important task to extract the data from these tables. Some work has already been done in this field, wherein [1] suggests a method to label each line of the document as NONTABLE, BLANK LINE, SEPARATOR, etc. The problem with this methodology would be if there are a lot of pages in the

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# Contents

# Named Entity Recognition for Rental Documents Using NLP


**Chinmay Patil, Sushant Patil, Komal Nimbalkar, Dhiraj Chavan, Sharmila Sengupta, and Devesh Rajadhyax**

**Abstract** Information retrieval is the process of extracting a pertinent set of facts from a text or a document. The documents are of unstructured format, and thus, information retrieval techniques aim at organizing this data. Named Entity Recognition is one of the information retrieval techniques which classifies a particular word or a phrase in its appropriate class. NER can thus, also be used in extracting entities from legal documents, which would help in providing an effective way to represent these documents. This would reduce the task of a lawyer scrutinizing the document, multiple times, to look for the same set of information. NER systems can be developed with different approaches, one of which is utilizing an NLP library. However, these pretrained NLP libraries may or may not be suitable for a particular use case. Hence, in this paper, we depict an approach to analyze rental documents by custom training spaCy NLP library for tagging named entities such as a person, address, amount, date, etc. The system will provide an interface for the user to upload rent documents, and the result analysis will be stored for quick insights into the document.

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# Saathi—A Smart IoT-Based Pill Reminder for IVF Patients

**Pratiksha Wadibhasme, Anjali Amin, Pragya Choudhary, and Pallavi Saindane**

**Abstract** Women undergoing In Vitro Fertilization (IVF) treatment have to strictly administer the stringent schedule of the entire process, which leaves them physically and emotionally exhausted. Saathi is a smart IoT-based pill reminder which aims to help the women opting for the IVF. Saathi is specially designed for IVF undergoing women, giving them the facilities of setting the reminder of their daily medications and injections, having real-time tracking of medicine consumption, maintaining their prescriptions, generating reports from real-time tracking of medicine consumption, and also allowing them to communicate with their doctor. Thus, it helps the patient to adhere to their strict schedule and monitor their intake.

## 1 Introduction

Infertility or a couple being unable to conceive a child can cause significant stress and unhappiness, which can lead to psychological consequences as well. Around 12-15% couples in the USA are unable to conceive. Nowadays, the most used method of assisted reproductive technologies is In Vitro Fertilization (IVF). The process itself is expensive and has to follow strict rules for medication use [1]. Even if you follow the process strictly, there are only 30–40% chances of success. There are many medicine reminder applications, even nowadays we can set reminders in our phone too. There is no medicine reminder application that is linked with the pillbox itself through the cloud.

Our smart pillbox along with a software application makes it easier for users to remind them to take pills and keep track of their medications. Now, the question arises as to how many people will adapt to this trend of using a smart pillbox replacing the traditional method of manually remembering all medications. To check the acceptance level of the people to use a smart pillbox, a study has been carried

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# sVana—The Sound of Silence

**Nilesh Rijhwani, Pallavi Saindane, Janhvi Patil, Aishwarya Goythale, and Sartha Tambe**

**Abstract** When it comes to living in a society, it is important to communicate with people around us for a better living and to survive in the human race and when it comes to communication with people, the one who are hearing or speech inpaired are always left behind, in other words, they have a problem communicating with other people and when it comes to video calling, they always had to use the usual text chat to communicate. Our aim is to remove this barrier and create a platform where hearing and speech impaired people can communicate even via video calls. The proposed system translates Indian sign language (ISL) into text for the hearing-impaired user while for the normal user, and it converts the speech into text. It also helps hearing-impaired people to communicate with Google Voice Assistants without having voice making it a smart assistant.

## 1 Introduction

Communication is the only means to access the information and thereby get different opportunities. While we see that we are completely surrounded by technology, can

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# Coreveillance—Making Our World a "SAFER" Place

**C. S. Lifna, Akash Narang, Dhiren Chotwani, Priyanka Lalchandani, and Chirag Raghani**

**Abstract** The culture in our civic society has undergone an abrupt change due to the extensive use of CCTV surveillance. Currently, our urban society is exclusively dependent upon CCTV footage for divulging any abnormal situation. This scenario has given rise to new openings for the researchers to judiciously utilize video analytics techniques to focus on many sensitive issues in society such as contravention of human rights (HR). The purpose of this paper is to design a surveillance platform equipped with situation intelligence to aid government and non-government working departments in taking corrective action against unfavorable intruders and destructive mishaps.

## 1 Introduction

In this modern era of the smart world, as discussed in paper [1], we have achieved great heights by implementing various technical features in various aspects of our daily life. Security is the key for a person's safety. The most commonly used security

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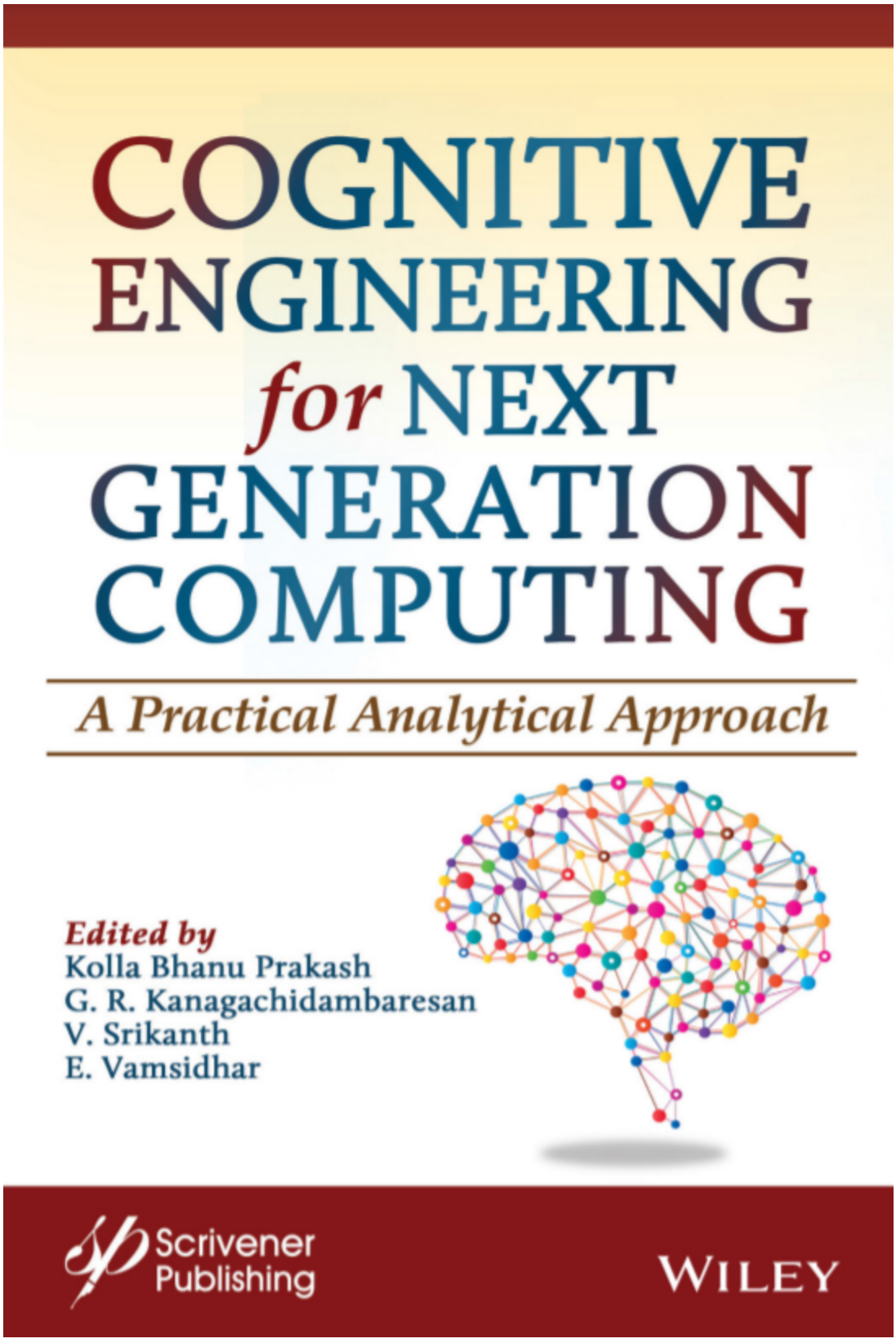
**10) Cognitive Engineering for Next Generation Computing: A Practical Analytical Approach**



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# Contents

# 11

# Ensuring Security and Privacy in IoT for Healthcare Applications

**Anjali Yeole* and D.R. Kalbande**

*Vesit, Mumbai, India*

***Abstract***

Healthcare is a service whose forthcoming appears to be motivated by innovation and data sharing. We can effectively use Internet of Things (IoT)-based healthcare systems for patient monitoring and emergency response services by maintaining security and preserving the privacy of patient's medical records. IoT devices in healthcare can gather patient's body parameters and share information with doctors, nurses and patient's relatives. Most of the time traditional method of manual recording of body parameters and reporting them to the doctors is used. This is obtained by nurses periodically for all patients. Their precious time is for taking care of patients not for recording body parameters all the time. IoT-enabled healthcare industry is the solution for the same. This article focuses on architectures and models for IoT-based Healthcare applications along with security, privacy issues and challenges by considering industry standards. Using IoT devices for health monitoring at a personal level is very easy and comfortable but using IoT at hospital level is challenging hence integration of E-health and IoT will also be discussed in this article.

***Keywords:*** IoT, healthcare, security

## 11.1 Introduction

With the expansion of the IoT healthcare service is growing. The cause of this chapter is to validate how the IoT is transmuting the healthcare sector as well as the role of Information Technology in healthcare. It is necessary to transform the lives of people with better healthcare services with IoT applications. IoT in

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# Contents

# Suvarga: Promoting a Healthy Society

**R. L. Priya, Gayatri Patil, Gaurav Tirodkar, Yash Mate, and Nikhil Nagdev**

**Abstract** In India, over 22% of the population is below the poverty line. This poverty pushes people on streets which in the future transforms into slums. These slums, as are not planned, lack certain necessities like electricity, sanitary services, and basic hygiene resources leading to a hub for the spread of diseases. In essence, the primary aim of this paper is to identify the leading causes of diseases in slum areas of Mumbai using data collected from IoT modules, health checkup drives, and various government authorities. With this information, the concerned civic authorities and slum residents will be alerted regarding the danger so that necessary action can be taken. This, in turn, promotes the healthier society in various slum regions of India.

**Keywords** Internet of things (IoT) · Slum management · Sanitation · Decision tree · LSTM · Air quality index · Water quality index

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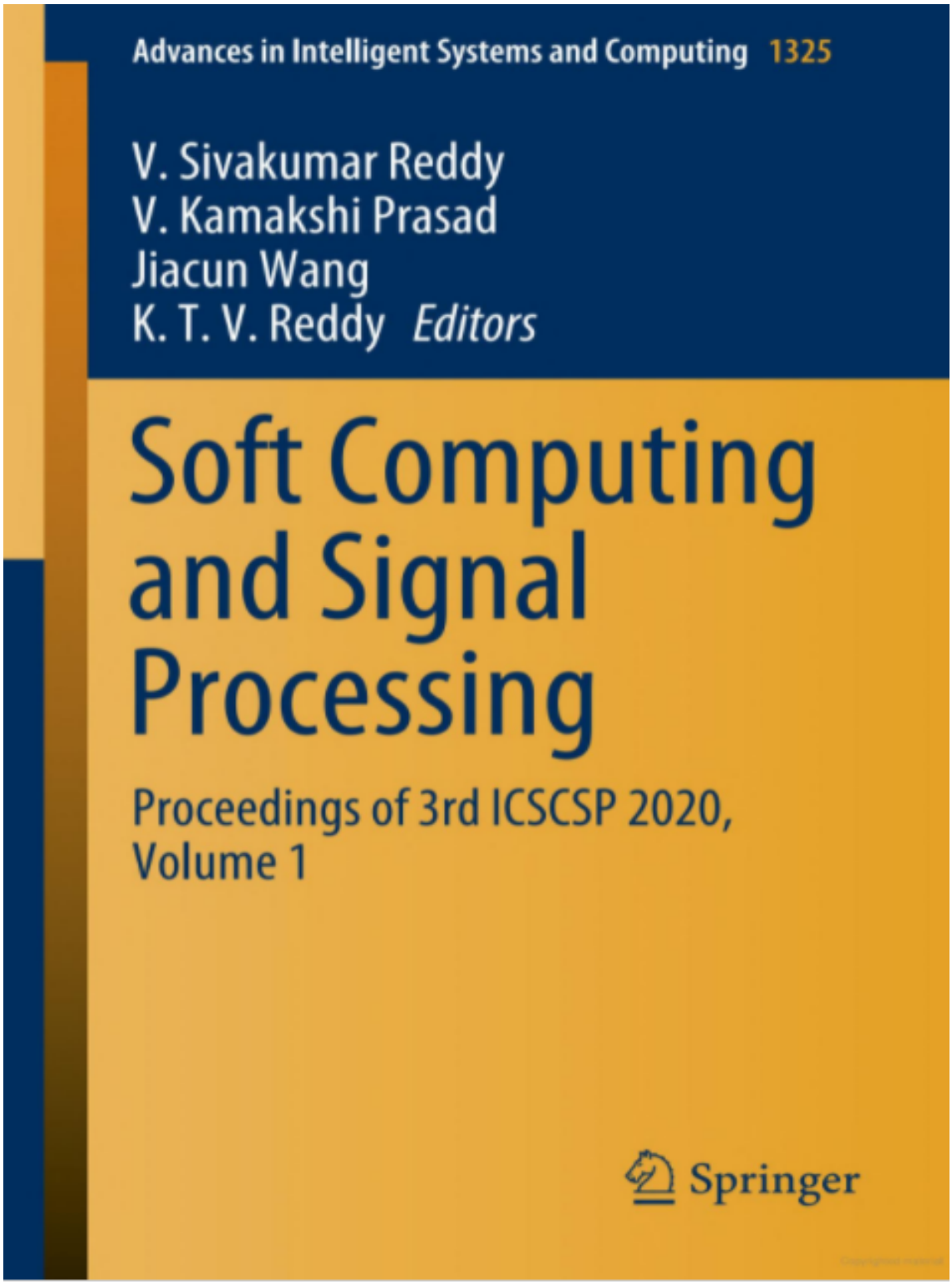

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# Contents

# Analyzing the Impact of Deforestation and Population on Carbon Footprint in Indian Cities Using Statistical and Deep Learning Techniques

**Stevert Lobo, Ishma Amin, Meenakshi Agarwal, Rahul Gurnani, and R. L. Priya**

**Abstract** Reducing carbon emissions in India has been very challenging in recent years. India's carbon dioxide ($CO_2$) emissions are growing at a faster rate than in any other major energy-consuming nation, while the vegetation cover comprises only 25% of the geographic area of the country. The proposed system aims to investigate the influence of deforestation on the increase of carbon emissions in metropolitan cities. Based on the carbon footprint analysis, the system helps to predict the effect of deforestation on carbon emission growth over the next few years. Various spatial–temporal features including vegetation cover, population and GHG emissions (in metric tons) of Indian cities from 1998 to 2020 have been considered in the analysis. The GHG emissions are converted to their $CO_2$ equivalents ($CO_2e$) by multiplying them with their Global Warming Potential (GWP). By applying statistical models like ARIMA, VAR and machine learning techniques such as random forest and LSTM on the dataset, we have formulated a relationship between deforestation and carbon footprint growth as well as provided an estimate for the next 10 years.

**Keywords** Carbon footprint · Deforestation · ARIMAX · VAR · Random forest · LSTM · KNN imputation · MICE imputation · Machine learning · Deep learning · Grangers causality test · Autocorrelation

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# Emerging Technologies in Data Mining and Information Security

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# Contents

# Cataract Eye Detection Using Machine Learning Models

**Ankush Shetty, Kunal Bathija, and Priya R. L.**

**Abstract** A cataract is clouding of the eye lens which results in decrease of vision. The existing systems are limited to use of small size image datasets resulting in lesser accuracy, and user-friendly application is not available. The proposed model is designed to use image classification models to differentiate a healthy eye and an eye with cataract. To classify types of images, it uses the VGG16 model. This model has 16 layers. The image is convoluted and pooled at each layer of the model. With the VGG16 model, the rural denizens will be able to determine whether a person is suffering from cataract or not, without consulting an ophthalmologist. The output is then classified accordingly. The proposed system provides a UI for the detection of cataract disease.

**Keywords** Cataract detection · Classification · VGG16 model for classification

## 1 Introduction

Cataract is a serious eye disease, which has affected over 65.2 million people worldwide. Cataract is produced due to clouding of the eye lens which results in blocking the light to go through the lens and project image on the retina. This results in partial transfer of the whole image to the brain which leads to blindness.

According to the National Blindness and Visual Impairment Survey India 2015–19 "The major reason for blindness is cataract for people of 50 years and above. Cataract is the root cause behind 66.2% blindness cases, 80.7% severe visual impairment cases

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