LITERATURE REVIEW

H.AkaikeInstitute for Statistical Mathematics, Minato, Tokyo, Japan have proposed A new look at the statistical model identification

The history of the development of statistical hypothesis testing in time series analysis is reviewed briefly and it is pointed out that the hypothesis testing procedure is not adequately defined as the procedure for statistical model identification. The classical maximum likelihood estimation procedure is reviewed and a new estimate minimum information theoretical criterion (AIC) estimate (MAICE) which is designed for the purpose of statistical identification is introduced. When there are several competing models the MAICE is defined by the model and the maximum likelihood estimates of the parameters which give the minimum of AIC defined by AIC = (-2)log-(maximum likelihood) + 2(number of independently adjusted parameters within the model). MAICE provides a versatile procedure for statistical model identification which is free from the ambiguities inherent in the application of conventional hypothesis testing procedure. The practical utility of MAICE in time series analysis is demonstrated with some numerical examples.

Zhou Wang, Howard Hughes Medical Institute, Center for Neural Science and the Courant Institute for Mathematical Sciences, New York University, New York, NY, USA

He is currently a Research Associate at Howard Hughes Medical Institute and Laboratory for Computational Vision, New York University. Previously, he was a Research Engineer at AutoQuant Imaging, Inc., Watervliet, NY. From 1998 to 2001, he was a Research Assistant at the Laboratory for Image and Video Engineering, University of Texas at Austin. In the summers of 2000 and 2001, he was with Multimedia Technologies, IBM T. J. Watson Research Center, Yorktown Heights, NY. He worked as a Research Assistant in periods during 1996 to 1998 at the Department of Computer Science, City University of Hong Kong, China. His current research interests include digital image and video coding, processing and quality assessment, and computational vision.

Jia Deng,WeiDong,RichardSocher , Li-Jia Li , Kai Li , Li Fei-Fei have proposed A large-scale hierarchical image database Published in: **2009 IEEE Conference on Computer Vision and Pattern Recognition**

The explosion of image data on the Internet has the potential to foster more sophisticated and robust models and algorithms to index, retrieve, organize and interact with images and multimedia data. But exactly how such data can be harnessed and organized remains a critical problem. We introduce here a new database called “ImageNet”, a large-scale ontology of images built upon the backbone of the WordNet structure. ImageNet aims to populate the majority of the 80,000 synsets of WordNet with an average of 500–1000 clean and full resolution images. This will result in tens of millions of annotated images organized by the semantic hierarchy of WordNet. This paper offers a detailed analysis of ImageNet in its current state: 12 subtrees with 5247 synsets and 3.2 million images in total. We show that ImageNet is much larger in scale and diversity and much more accurate than the current image datasets. Constructing such a large-scale database is a challenging task. We describe the data collection scheme with Amazon Mechanical Turk. Lastly, we illustrate the usefulness of ImageNet through three simple applications in object recognition, image classification and automatic object clustering.We hope that the scale, accuracy, diversity and hierarchical structure of ImageNet can offer unparalleled opportunities to researchers in the computer vision community and beyond.

Shaoqing RenUniversity of Science and Technology of China, Hefei, Anhui, China, Kaiming HeVisual Computing Group, Microsoft Research, Beijing, China , Ross Girshick Facebook AI Research, Seattle, WA 98109 , Jian SunVisual Computing Group, Microsoft Research, Beijing, China have proposed Faster R-CNN: Towards Real-Time Object Detection with Region Proposal Networks published in IEEE Transactions on Pattern Analysis and Machine Intelligence (Volume: 39, Issue: 6, 01 June 2017)

State-of-the-art object detection networks depend on region proposal algorithms to hypothesize object locations. Advances like SPPnet [1] and Fast R-CNN [2] have reduced the running time of these detection networks, exposing region proposal computation as a bottleneck. In this work, we introduce a Region Proposal Network(RPN) that shares full-image convolutional features with the detection network, thus enabling nearly cost-free region proposals. An RPN is a fully convolutional network that simultaneously predicts object bounds and objectness scores at each position. The RPN is trained end-to-end to generate high-quality region proposals, which are used by Fast R-CNN for detection. We further merge RPN and Fast R-CNN into a single network by sharing their convolutional features-using the recently popular terminology of neural networks with 'attention' mechanisms, the RPN component tells the unified network where to look. For the very deep VGG-16 model [3], our detection system has a frame rate of 5 fps (including all steps) on a GPU, while achieving state-of-the-art object detection accuracy on PASCAL VOC 2007, 2012, and MS COCO datasets with only 300 proposals per image. In ILSVRC and COCO 2015 competitions, Faster R-CNN and RPN are the foundations of the 1st-place winning entries in several tracks. Code has been made publicly available**.**

FehmiAyberkUçkunElektrik-ElektronikMühendisliğiBölümü, BoğaziçiÜniversitesi, İstanbul, TÜRKİYE ,HakanÖzerElektrik-ElektronikMühendisliği, Bölümü, BoğaziçiÜniversitesi, İstanbul, TÜRKİYE , EkinNurbaşESEN SistemEntegrasyon, ODTU Teknokent, Ankara, TÜRKİYE , EmrahOnat
ESEN SistemEntegrasyon, ODTU Teknokent, Ankara, TÜRKİYE have proposedDirection Finding Using Convolutional Neural Networks and Convolutional Recurrent Neural Networks published in 2020 28th Signal Processing and Communications Applications Conference (SIU)

In this paper, alternative direction finding methods have been proposed using deep learning techniques. Firstly, Regeression and Classification models have created by using Convolutional Neural Networks (CNNs). In the second Convolutional Neural Networks and Recurrent Neural Networks (RNNs) have been utilized in the proposed methods. Despite having vast amounts of directions finding studies, utilization of neural networks is scarce in

literature and past works mostly only includes usage of CNNs. In this study, direction finding is performed by learning signals reaching multiple antenna arrays by networks. Created neural networks have been fed with different data formats and their performances against noisy and no-noise data have been shown. In addition, comparative analysis of the developed models were made in the similar Signal-to-Noise Ratio (SNR) range with the subspace based MUSIC algorithm, which is frequently used in direction finding.

P. N. ArathiSri Ramakrishna Engineering College, Coimbatore, Tamil Nadu, TN. S. ArthikaDepartment of Electronics and Instrumentation Engineering, Sri Ramakrishna Engineering College, Coimbatore, Tamil Nadu, India. S. PonmithraDepartment of Electronics and Instrumentation Engineering, Sri Ramakrishna Engineering College, Coimbatore, Tamil Nadu, India .K. SrinivasanDepartment ofElectronics and Instrumentation Engineering, Sri Ramakrishna Engineering College, Coimbatore, Tamil Nadu, India . V. RukkumaniSri Ramakrishna Engineering College, Coimbatore, Tamil Nadu, INhave proposed Gesture based homeautomation systempublished in: 2017 International Conference on Nextgen Electronic Technologies: Silicon to Software (ICNETS2)

Automation is the essential need for the present world. There are various types of automations like building automation, industrial automation, Home automation, Artificial Intelligence, etc. Smart can be a potential application which provides support to elderly or disabled persons. Home automation is the use and control of home appliances remotely or automatically. Day by day the gap between machines and humans is being reduced. Nowadays hand-gesturebased home automation is getting more importance. Gesture recognition refers to recognising the motion of the human parts like hand, face, etc. Most of the electronic components manufactures focuses on the hand gesture basis. In this proposed work MATLAB based algorithm is used. This proposed work uses this tool for the recognition and processing of the hand gesture. The algorithm used for this proposed work is the object detection algorithm. At first the image is captured by the camera and it is processed by the MATLAB, if the preloaded gesture is matched with the existing gesture the data will be sent to the microcontroller, then the home appliances are controlled. There are other applications which could be controlled by a gesture such as media players, robots and virtual

objects. The hardware module consists of camera, PIC microcontroller, fan, light, power supply, LED, GSM module. This hardware module is communicated with simulation software using a USB to serial converter bus which comes along with driver software.

Bidyut Jyoti Boruah
Dept. of Electronics and Communication Engineering, Gauhati University, Guwahati, Assam, India
Anjan Kumar Talukdar
Dept. of Electronics and Communication Engineering, Gauhati University, Guwahati, Assam, India
Kandarpa Kumar Sarma
Dept. of Electronics and Communication Engineering, Gauhati University, Guwahati, Assam, India

Have proposed Development of a Learning-aid tool using Hand Gesture Based Human Computer Interaction System. Published in: 2021 Advanced Communication Technologies and Signal Processing (ACTS)

A hand gesture recognition system is a natural and simple way of communicating in today's world. The development of teaching methods by using technology-dependent useful items to increase communication and interaction between the teacher and the student is a major part of today's e-learning. In this paper, we have proposed an interactive learning-aid tool based on a vision-based hand gesture recognition system. The system uses MediaPipe for hand gesture recognition. The recognized hand gestures use a virtual-mouse-based object controlling system to control various virtual objects created using Unity. The system has been tested using six hand gestures and it is found that the system can be used effectively for controlling various virtual objects.