

## Curriculum Vitae

Dr. Nirmal Kaur, Assistant Professor (Senior-scale), Dept. of Computer Sc. & Engg.,  
U.I.E.T., Sector 25, Panjab University, Chandigarh.  
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### Research Interests:

- Machine Learning, Deep Learning (Audio and Video Deepfake Detection, Human Pose Estimation)
- Sentiment Analysis (Text, Audio, Video and Multimodal)
- Distributed Computing (Task Scheduling, energy aware scheduling)

### Sponsored Research Projects:

- **Principal Investigator:-** Major Research Project on “Development of Multimodal and Multilingual Emotion Detection System” for the financial year 2023-25 sanctioned by **IIT Mandi iHub & HCI Foundation. (Amount: 32.34 Lacs, Status: Ongoing)**
- **Principal Investigator:-** Major Research Project on “Cyber Security-Challenges under Cyber Space Specially for women users- Investigating Cyber Initiated Crimes against Women Users in the Punjab State” for the financial year 2020-21. The project is sanctioned by **National Commission For Women, Govt. of India, New Delhi. (Funding Amount: 14.20 Lacs, Status: Completed) .**

### Edited Book:

Editor for the book chapters for book entitled “**Victimization of Women in Cyber Space: Issues and Challenges**” Saptrishi Publications, Chandigarh approved by UGC, ISBN: 978-81-19011-81-0 Edition: 2023.

### Education:

**Ph.D** Computer Sc. & Engg. from I.K.Gujral Punjab Technical University, Jalandhar, India in November, 2017.

**Title:** Energy Efficient Scheduling Techniques in Distributed Computing systems.  
**Supervisor:** Prof. and Dean (R&D) Dr. Savina Bansal, MRSPTU, Bathinda.

Complete thesis is available online on shodhganga repository at:  
<https://shodhganga.inflibnet.ac.in/handle/10603/194841>

**M.Tech** Computer Sc. & Engg. with 75.4% (Distinction and Topper) from Baba Banda Singh Bahadur Engg. College Fatehgarh Sahib, **PTU**, India in 2009.

**B.Tech** Computer Sc. & Engg. with 73.5% from Dept. of CSE, Punjabi University Campus, Patiala, India in 2003.

### **Teaching Experience: 19+ Years**

- Presently Assistant Professor (Stage 2), Dept of Computer Sc. & Engg., University Institute of Engg. & Technology (UIET), Panjab University, Chandigarh from 24<sup>th</sup> August 2011-till date.
- Assistant Professor, Bhai Gurdas Institute of Engg. & Tech, Sangrur from 20<sup>th</sup> Jan 2005-22<sup>st</sup> August 2011.
- Assistant Professor, Swami Vivekanad Institute of Engg. and Tech from 2<sup>nd</sup> June 2004 to 19<sup>th</sup> Jan 2005.

### **Ph.D Research Guidance**

<b>Candidate Name</b>	<b>Title</b>	<b>Research Fellowship</b>
Staffy Kingra (Ph.D Completed)	Deep Learning Model for Deepfake Detection in Multimedia Content	Under UGC-JRF
Priyanka Thakur (Enrolled)	Deep Learning Based Multilingual Emotion Detection System (Tentative)	Research project grant sponsored by IIT Mandi iHub & HCI Foundation
Amritpal Kaur (Enrolled)	-	Under Visvesvaraya PhD Scheme

### **M.E. Research Guidance**

<b>Candidate Name</b>	<b>Title</b>	<b>Status</b>
Punit Sohanvi	Human Pose Estimation Techniques	Ongoing
Abhishek Dixit	Deep learning based audio deepfake detection techniques	Degree Awarded (year 2023)

Mansi	Deep learning based video deepfake detection techniques	Degree Awarded (year 2023)
Akanksha	Energy aware scheduling algorithm in heterogeneous computing system	Degree Awarded (year 2019)
Navdeep Kumar	RGB-Depth image classification using pre-trained deep convolution neural network	Degree Awarded (year 2019)
Ramandeep Kaur Bhinder	Energy aware clustering scheduling of parallel applications in heterogeneous computing systems	Degree Awarded (year 2018)
Sumandeep Kaur	Modified Genetic Algorithm based solution for task scheduling in cloud computing	Degree Awarded (year 2018)
Krishan Kumar	Energy efficient Communication Protocol for chain-based clustered WSNs	Degree Awarded (year 2018)
Sukhjot Singh	A heterogeneous static hierarchical expected completion time based scheduling algorithm in multiprocessor system	Degree Awarded (year 2016)
Pankaj Goyal	Genetic algorithm based optimization technique for power management in heterogeneous multi-tier web clusters	Degree Awarded (year 2015)
Mehak Aggarwal	Heterogeneous scheduling using controlled duplication in multiprocessor system	Degree Awarded (year 2016)

Google scholar citations at: <https://scholar.google.com/citations?user=r3rbMsoAAAAJ&hl=en>

## **Journal Publications:**

- SFormer: An end-to-end spatio-temporal transformer architecture for deepfake detection, *Forensic Science International: Digital Investigation*, 2024 <https://doi.org/10.1016/j.fsidi.2024.301817> (SCI, IF: 2, Elsevier).
- SiamNet: Exploiting Source Camera Noise Discrepancies Using Siamese Network for Deepfake Detection, *Information Sciences*, 2023, vol. 645, pp. 119341 (SCI, IF: 8.1, Elsevier)
- Emergence of deepfakes and video tampering detection approaches: A survey, *Multimedia Tools and Applications*, 82(7), 10165–10209. <https://doi.org/10.1007/s11042-022-13100-x> (SCI, IF: 3.6, Springer).
- LBPNet: Exploiting texture descriptor for deepfake detection, *Forensic Science International: Digital Investigation*, 42, 301452. <https://doi.org/10.1016/j.fsidi.2022.301452> (SCI, IF: 2, Elsevier).
- Review of Audio Deepfake Detection Techniques: Issues and Prospects, *Expert Systems*, 2023, 40(8), e13322. (SCIE, IF: 3.3, John-Wiley).
- Duplication Controlled Static Energy Efficient Scheduling on Multiprocessor Computing System, *Concurrency and Computation: Practice and Experience*, 2017, 29(12): e4124. (SCI, IF: 2, Wiley Journal).
- Energy Conscious Scheduling with Controlled Threshold for Precedence Constrained Tasks on Heterogeneous Clusters, *Concurrent Engineering: Research And Applications*, 2017, 25(3), pp. 276-286. (SCIE, IF: 1.456, Sage Journal).
- Face-manipulated Deepfake Generation and Recognition Approaches: A Survey, *Smart Science*, 2024, 12(1), pp. 53-73, <https://doi.org/10.1080/23080477.2023.2268380>, (Scopus and WoS, Taylor and Francis).
- Survey on energy efficient scheduling techniques on cloud computing, *Multiagent and Grid Systems*, 2021, 17(4), pp. 351-366 (Scopus and WoS, IOS press)
- Energy Efficient Duplication Based Scheduling For Precedence Constrained Tasks on Heterogeneous Computing Cluster, *Multiagent and Grid Systems*, 2016, 12(3), pp. 239-252.(SCOPUS and Web of Science, IOS Press).

- Energy Aware Clustering Scheduling of Parallel Applications on Heterogeneous Computing Systems, Multiagent and Grid Systems, An International Journal of Cloud Computing and Artificial Intelligence, 2019, 15(1), pp. 1-18.(**SCOPUS and Web of Science, IOS Press Journal**).
- Red Green Blue Depth Image Classification Using Pre-Trained Deep Convolutional Neural Network, Pattern Recognition and Image Analysis, Springer Journal of the Russian Academy of Sciences, 2020, 30(3), pp. 382-390. (**SCOPUS and Web of Science, IF: 0.93, Springer Journal**).
- Heterogeneous Scheduling Using Controlled Duplications on Multiprocessor System, International Journal of Control Theory and Applications, 2016, 9(45), pp. 155-165. (**SCOPUS**).
- Modified Genetic Algorithm Based Solution For Task Scheduling in Cloud Environment, Indian Journal of Computer Science and Engineering, 2018, 9(2), pp. 61-68.
- Energy Efficient Communication Protocol for Chain-based Clustered WSNs, International Journal of Grid and Distributed Systems, 2018, 11(9), pp.81-92 (**SCOPUS**).
- Power Management Techniques: Power Simulators and Dynamic Power Management, Recent Trends in Parallel Computing, 2016, 3(2), pp. 1-7.
- Survey on Energy Aware Scheduling Algorithms of DAG Applications for Multiprocessor Computing System, 2016, IJARCSSE, 6(4), pp. 334-340.
- Genetic Algorithm Based Optimization Technique for Power Management in Heterogeneous Multi-tier Web Clusters, International Journal of Application or Innovation in Engineering & Management, 2015, 4(1), pp. 156-162.
- An Optimization Technique Based On Genetic Algorithm For Power Management In Heterogeneous Multi-tier Web Clusters, International Journal of Computer Application, 2015, 115(17), pp. 26-31.
- Impact of Duplication Scheduling and Dynamic Voltage Scaling on Power-Performance of Parallel Applications on Computing Systems, International Journal In Applied Studies And Production Management, 2014, 1(1), pp. 75-84.
- Task Scheduling and Energy Conservation Techniques for Multiprocessor Computing Systems,” International Journal of Networks and Systems, 2013, 2(2), pp. 5-8.

- Energy aware Scheduling Strategies for Distributed Computing System, International Research in Journal Of Advanced Computer Science and Software Engineering, 2013, 3(10), pp. 280-283.
- A Heterogeneous Static Hierarchical Expected Completion Time Based Scheduling Algorithm in Multiprocessor System, International Research Journal of Engineering and Technology (IRJET), 2016, 3(2), pp. 95-956.
- Quality Analysis of Different Types of Noise Removal Filters, Coimbatore Institute of Information Technology, 2009, Print: ISSN 0974 – 9691 & Online: ISSN 0974 – 9586.

### **National/ International Conferences/Book Chapters:**

SiamLBP: Exploiting Texture Discrepancies for DeepFake Detection: Proceedings of 4th International Conference on Machine Intelligence and Signal Processing organized by National Institute of Technology, Raipur, India, Springer, LNEE series, 2022 (**Best Paper Award, Springer, SCOPUS**).

Detection of false reviews on e-commerce: Survey, Third International conference on Artificial Intelligence, 5G Communications and Network Technologies organised by Dept. of ECE, Velammal Institute of Technology, Chennai on 23<sup>rd</sup>- 24<sup>th</sup> March, 2023.

Deep-learning based framework for deepfake detection, 15<sup>th</sup> Chandigarh Science Congress 2022 organized by Panjab University, Chandigarh.

Major Convolutional Neural Networks in Image Classification: A Survey, Proceedings of International Conference on IoT Inclusive Life (ICIIL 2019), NITTTR Chandigarh, India. Lecture Notes in Networks and Systems, vol 116. Springer, Singapore, pp. 243-258.

Towards Energy Efficient Scheduling with DVFS for Precedence Constrained Tasks on Heterogeneous Cluster System,” In: 2<sup>nd</sup> International Conference on Recent Advances in Engineering and Computational Sciences, Chandigarh, 2015, 21-22 December, pp.1-6. India: IEEE.(**SCOPUS**).

Efficient Image Watermarking Technique to Improve Payload and Robustness Without Affecting Perceptual Quality of Image Data, Proc. International Conference indo-global colleges, Abhipur, 2009.

Imperceptibility and Robustness of Digital Image Watermarking in the Discrete Wavelet Transform Domain” Proc. PCTE Journal of Computer Sciences, Bi-Annual Journal, 2010, pp. 96-102.

ISTE sponsored National Paper Published on “Hybrid Image compression using LZW method” in 2007.

ISTE National Paper Published on “Virtual Private Network” in 2008.

ISTE National Paper Published on “Comparison of image compression algorithms” in 2008.

ISTE National Paper Published on “Robustness of image Watermarking Techniques” in 2009

ISTE National Paper Published on “Region based image fusion algorithms” in 2009.

### **Invited Talks/Expert Lectures/Workshops Organized:**

Organized one day workshop on “Human Emotion Understanding in Public Speech” held at Dept. of Indian Theatre, Panjab University, Chandigarh on 5<sup>th</sup> March, 2024.

Delivered expert lecture on “Data Collection Strategies for Field Survey” held at UIET, Panjab University, Chandigarh on 15th March, 2021.

Organized two days workshop on “Qualitative Research: Data Collection, Analysis, and Management” held at UIET, Panjab University, Chandigarh on 12-14 August, 2021.

Delivered expert lecture on STC on title “Energy Aware Scheduling- Need and Technique” held at Guru Nanak Dev Engineering College, Ludhiana during 31st December 2018- 4th January, 2019.

Delivered expert lecture on “DWT based image watermarking technique” held at Quest group of institutions, Mohali, 2012.

### **Academic Responsibilities:**

- Member of Board of Studies (BOS), Panjab University Chandigarh.
- Member of mini SC/ST cell, UIET.
- Member of Research Degree Committee (RDC), Panjab University Chandigarh.
- Member of Academic and Administrative Committee, UIET, Panjab University Chandigarh.
- Member of Institution’s Innovation Council (IIC) sponsored by MHRD.
- Member of UTECHNOS committee.
- Convener, Student Mentoring System
- Convener, Students Attendance and Medical Record
- ISTE (Indian Society for Technical Education) – Life Member

### **FDPs/STCs/Workshops Attended:**

- Attended UGC-HRDC Refresher course on “Information and Communication Technology (ID)” from 10/07/2023 to 22/07/2023, organized by Himachal Pradesh University, Shimla.
- Attended workshop on “Skill Enhancement Course/Workshop on Introduction to Data Science” from 1st Feb-21st Feb, 2023 under RUSA Project Grant, organized by DCSA, Panjab University, Chandigarh
- Attended the three days program on “Train The Trainer Program on creating Microsites on Infosys Springboard” from 24th – 27th January, 2022.
- Attended five day AICTE ATTAL FDP on ‘Internet of Things(IoT)’ from 20-04-2020 to 24-04-2020 organized by NITTTR, Chandigarh.



- Participated in two weeks MHRD online workshop on “Advance Concepts for Learning MOOCs” from 2-7-2020 to 17-7-2020.
- Attended one day programme on “Book and Article Publishing and SpringerLink Platform Demonstration” organized by GNDU Amritsar.
- Attended two days workshop on “IBM Rational Robot” sponsored by IBM.
- Attended the one day seminar on “Patent Awareness” sponsored by PIC, Chandigarh.
- Attended the five days workshop on “Generic Skill Development” sponsored by NITTR & MHRD.
- Attended the two days Workshop on “Rational Robot as a Software Testing Tool” conducted by IBM.
- Attended 6<sup>th</sup> Chandigarh Science Congress held at Panjab University, Chandigarh dated on 26-28 February 2012.
- Attended orientation programme from 14-5-2013 to 10-6-2013.
- Participation in Faculty development Program “Achieving Excellence in Technical Education”, Organized in collaboration with Infosys dated on 16-19th July 2013.
- Participated in NPTEL workshop held at ICSSR complex, Panjab University Chandigarh dated on 5<sup>th</sup> August 2013.
- Attended 9<sup>th</sup> Chandigarh Science Congress held at Panjab University, Chandigarh dated on 25-27 February, 2015.
- Attended oracle sponsored faculty development program on database design using SQL programming dated 04.05.2015 to 08.05.2015.
- Attended refresher programme on Research Methodologies from 3-7-2014 to 23-7-2014.
- Organized and attended TEQIP sponsored one week workshop on Image processing and machine learning for pattern recognition held at UIET, PU, Chandigarh from 11-16<sup>th</sup> July, 2016.

### **Achievements:**

- Awarded with Best research award from CSE Dept., UIET in the year 2017.
- Awarded scholarship from Punjab Govt. on the basis of matriculation examination in the year 1997.

- Awarded certificate of recognition for Best paper award in the 4<sup>th</sup> international conference on Machine intelligence and signal processing organized by dept. of CSE, NIT, Raipur, 2022.

**Reviewer:**

IEEE access, Wiley, IEEE- VLSI, Elsevier, Sage