Brief Curriculum Vitae

Prof Phool Singh
MPhil, PhD, CSIR-NET, GATE (2006, AIR 23)
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Department of Applied Sciences and Humanities,
School of Engineering and Technology, Central University of Haryana

Prof Phool Singh received his Ph.D. in Mathematics from Banasthali University in the area of Computational Fluid Dynamics, and MPhil, MSc, and BSc from Maharshi Dayanand University, Rohtak. He has been working at the Central University of Haryana as a Professor of Mathematics in the Department of Applied Sciences and Humanities at the School of Engineering and Technology, Central University of Haryana. He has also served as Dean of the School of Engineering and Technology. Earlier, Prof Singh served Avvaiyar Government College for Women, Karaikal, Puducherry, and The NorthCap University Gurugram as Assistant Professor of Mathematics. In 2006, he qualified CSIR-NET, and GATE (AIR- 23). He is an active researcher and published more than 100 research papers in international journals of repute and edited four conference proceedings. He has diverse research interests encompassing optical image processing, computational neuroscience, and computational fluid dynamics and promotes open-source software like Scilab, Octave, OpenFOAM. He has also worked as a Principal Investigator in a project (Parkinson's disease) funded by Cognitive Science Research Initiative (CSRI-DST). He is also featured in 2 percentile scientists published by Stanford University in November 2022 and October 2024.

- **Work Experience (Total Experience: More than 18 Years)**

S. No.	Institute Name	Designation	Duration	Major Role
1	Central University of Haryana (CUH)	Professor	3 Year + (21-Aug 21 to till date)	Teaching, Research, and Administration
2	Central University of Haryana (CUH)	Associate Professor	3 Years (21-Aug 18 to 20-Aug-21)	Teaching, Research, and Administration
3	Avvaiyar Government College for Women, Karaikal, Puducherry (UT)	Assistant Professor	7 Months (23- Jan 18 to 20-Aug-18)	Teaching
4	The NorthCap University, Gurugram, Haryana	Assistant Professor (AGP 8000)	10 Years and 5 Months (18-Sep-07 to 19-Jan-18)	Teaching, Research and Administration
5	GITM, Bilaspur, Gurgaon, Haryana	Lecturer	1 Year and 1 Month (08-Aug-06 to17-Sept-07)	Teaching

- **Administrative Experience in CUH (Last three year)**

S. No.	Responsibility	Duration	Specific Role
1	Dean, School of Engineering and Technology	27 Jan 2022- 26 Jan 2025	Administartion, Academics and Research in SoET
2	Member, Executive Council, Central University of Haryana	27 Jan 2022- 26 Jan 2025	
3	Member, Academic Council, Central University of Haryana	27 Jan 2022- 26 Jan 2025	
4	Chairman, Standing Committee, Admissions	Jan, 2024	
5	Controller of Examination (In-charge)	30 Apr 2021 to 23 Aug 2021	Conducted two Examination Office role
6	Nodal officer: Common Universities Entrance Test (CUET) Central Universities Common Entrance Test (CUCET)	CUET-2023 CUET-2022 CUCET 2021 CUCET-2020 CUCET-2019	Conducted entrance exam in four states including Haryana, Delhi, Uttar Pradesh, Uttarakhand and Chandigarh in CUCET 2019, 2020 Settling of accounts (Appr. 75 Lakhs)
7	Admission In-charge University level, Nodal Officer for Access: Student annual In-take of the Tripartite MoU (2020-21 & 2021-2022) between UGC, MHRD and CUH Member of Central Admission Advisory Committee	2019, 2020 and 2021, 2022	Hiring of agency for online counseling, Coordination with CUH departments Settling of accounts
8	First Appellate Authority- for RTI	Oct 2018 to 11 Feb 2020	Hearing appeals
9	Coordinator- Computer Centre	Jul 2019- Mar 2020	
10	Teacher-In-Charge B Tech CSE and HOD PPT, SOET	27 Aug 2018 to 18 Mar 2020, 27 Jan 2022- 26 Jan 2025	Regular classes of students Streamlined syllabus Conducted Board of Studies
11	Member of various University level Committee – ➢ Cell handling Student's grievances related to examination and other academic activities in Covid-19 ➢ Necessary preparation for conduct of examination and declaration of result. ➢ Creation of Central Computing facility ➢ Creation of Central instrumentation Centre ➢ Purchase of hardware and software of Smart Classrooms items ➢ Local Purchase Committee ➢ Procurement of MS Office licenses for University Desktop Systems		

	➢ Procurement of 500 Quickheal Antivirus ➢ Inspection Committee for freshly purchased Consumable and non-Consumable items ➢ NIRF and AQAR Team member ➢ NAAC Coordinator

- **Research Contribution** (Citations:1556, h-index:22 i10-index:44 as per Google Scholar)
- **Research Interest:** Mathematical Modelling, Computational Imaging, Computational Neuroscience, Soft-computing, CFD.
- **Research Publication in Journal (Last Six years in Central University of Haryana)**

S. No.	Details	Impact factor if any and indexing
1	Sachin, R. Yadav, R. Kumar, and ***P. Singh***, "Phase only CGH and sparse separation based approach to biometric image authentication," ***J Op***t, Sep. 2024, doi: 10.1007/s12596-024-02230-0.	1.60 SCI/ SCOPUS
2	R. Saini, A. K. Tiwari, A. Nath, ***P. Singh***, S. P. Maurya, and M. A. Shah, "Covering assisted intuitionistic fuzzy bi-selection technique for data reduction and its applications," ***Sci Rep***, vol. 14, no. 1, p. 13568, Jun. 2024, doi: 10.1038/s41598-024-62099-8.	4.011 SCI/ SCOPUS
3	S. Anjana, I. Saini, ***P. Singh***, and A. K. Yadav, "Asymmetric enciphering of images using affine transform and fractional Fourier transform," ***Int. J. Advanced Intelligence Paradigms***, vol. 29, no. 1, pp. 28–45, 2024, doi: https://doi.org/10.1504/IJAIP.2024.141523.	SCOPUS
4	R. Yadav, Sachin, and ***P. Singh***, "Multidomain asymmetric image encryption using phase-only CGH, QZS method and Umbrella map," ***J Opt***, Aug. 2024, doi: 10.1007/s12596-024-02106-3.	1.60 SCI/ SCOPUS
5	A. K. Tiwari, R. Saini, ***P. Singh***, T. Som, A. Nath, and S. Pramanik, "Information entropy-assisted intuitionistic fuzzy rough feature subset selection," ***Optimization***, pp. 1–29, Oct. 2024, doi: 10.1080/02331934.2024.2411438.	1.60 SCI/ SCOPUS
6	M. Samtiya et al., "Characterization of indigenous lactobacilli from dairy fermented foods of Haryana as potential probiotics utilizing multiple attribute decision-making approach," ***Food Prod Process and Nutr***, vol. 6, no. 1, p. 81, Sep. 2024, doi: 10.1186/s43014-024-00259-z.	4 SCI/ SCOPUS
7	A. K. Tiwari, R. Saini, A. Nath, P. Singh, and M. Mohd Asif Shah, "Hybrid similarity relation based mutual information for feature selection in intuitionistic fuzzy rough framework and its applications," ***Scientific Reports***, vol. 14, 2024.	4.011 SCI/ SCOPUS
8	R. Yadav, S. Phool, and Sachin, "Watermarking algorithm based on phase-only CGH in fractional Hartley domain for DICOM images," ***J. Opt.***, vol. 26, p. 065703, 2024.	2.1 SCI/ SCOPUS
9	R. Yadav, Sachin, and P. Singh, "Multiuser medical image encryption algorithm using phase-only CGH in the gyrator domain," ***J. Opt. Soc. Am. A***, vol. 41, no. 3, p. A63, Mar. 2024, doi: 10.1364/JOSAA.507308.	1.97 SCI/ SCOPUS

10	A. Tobria and P. Singh, “A comparative analysis of phase retrieval algorithms in asymmetric double image cryptosystem in gyrator domain,” ***Opt Quant Electron***, vol. 56, no. 1, p. 33, Jan. 2024, doi: 10.1007/s11082-023-05524-y.	2.794 SCI/ SCOPUS
11	Sachin *et al.*, “Advances in Optical Visual Information Security: A Comprehensive Review,” ***Photonics***, vol. 11, no. 1, p. 99, Jan. 2024, doi: 10.3390/photonics11010099.	2.4 SCI/ SCOPUS
12	S. Anjana, K. S. Gaur, H. Singh, P. Singh, and A. K. Yadav, “Security-enhanced optical nonlinear cryptosystem based on phase-truncated Fourier transform,” ***Opt Quant Electron***, vol. 55, no. 12, p. 1099, Nov. 2023, doi: 10.1007/s11082-023-05385-5.	2.794 SCI/ SCOPUS
13	A. Jaglan, G. Sadera, P. Singh, B. P. Singh, and G. Goel, “Probiotic potential of gluten degrading Bacillus tequilensis AJG23 isolated from Indian traditional cereal-fermented foods as determined by Multiple Attribute Decision-Making analysis,” ***Food Research International***, vol. 174, p. 113516, Dec. 2023, doi: 10.1016/j.foodres.2023.113516.	8.96 SCI/ SCOPUS
14	R. Yadav and P. Singh, “Asymmetric image authentication algorithm using double random modulus decomposition and CGI,” ***Comp. Appl. Math.***, vol. 42, no. 7, p. 305, Oct. 2023, doi: 10.1007/s40314-023-02443-2.	2.4 SCI/ SCOPUS
15	Singh, J., Singh, P., and Malik, V., "Insights into the Glutamatergic and GABAergic Connections in the Conductance-Based Model of Subthalamic Nucleus in Hyperdirect Pathway", ***Neurology India***, 71 (2): 278–284 (2023).	1.668 SCI/ SCOPUS
16	Anjana, S., Yadav, A., Singh, P., and Singh, H., "Audio and image encryption scheme based on QR decomposition and random modulus decomposition in Fresnel domain", ***Optica Applicata***, Vol. 52 (3): 359–374 (2022).	0.505 SCI/ SCOPUS
17	Sachin, Singh, P., and Singh, K., "Nonlinear image authentication algorithm based on double fractional Mellin domain", ***Nonlinear Dynamics***, 111 (14): 13579–13600 (2023).	5.741 SCI/ SCOPUS
18	Sachin and Singh, P., "Asymmetric Cryptosystem Based on Biological Mutation Operation in Chirp-Z Domain", ***Multimedia Tools And Applications***, (2023)	2.577 SCI/ SCOPUS
19	Sachin, R. Kumar, and P. Singh, “Multiuser optical image authentication platform based on sparse constraint and polar decomposition in Fresnel domain,” **Phys. Scr.**, vol. 97, No. 2022, p. 115101, 2022, doi: 10.1088/1402-4896/ac925d	2.93 SCI/ SCOPUS
20	J. Kumar, P. Singh, A. K. Yadav, “Asymmetric double-image encryption using twin decomposition in fractional Hartley domain,” **Optica Applicata**, vol. LII, No. 1, p. 21-35, 2022, doi: 10.37190/oa220102	0.58 SCI/ SCOPUS
21	Sachin, P. Singh, “A novel chaotic Umbrella map and its application to image encryption,” **Opt Quant Electron**, vol. 54, 266, 2022, doi:10.1007/s11082-022-03646-3	2.794 SCI/ SCOPUS
22	Sachin, R. Kumar, and P. Singh, “Modified plaintext attacks in a session for an optical cryptosystem based on DRPE with PF”, **Applied Optics**, vol. 61, No. 2, p. 623-628. Jan 2022, doi: 10.1364/AO.446070.	1.905 SCI/ SCOPUS
23	S. Anjana, P. Rakheja, A. K. Yadav, and P. Singh, “Asymmetric double image encryption, compression and watermarking scheme based on orthogonal-triangular decomposition with column pivoting,” **Optica Applicata**, vol. LII, No. 2, p. 283-295, 2022, doi: 10.37190/oa220210	0.58 SCI/ SCOPUS
24	Archana, P.Singh, and P. Rakheja, “Asymmetric watermarking scheme for color images using cascaded unequal modulus decomposition in Fourier	1.293 SCI/ SCOPUS

	domain", **Journal of Modern Optics**, vol. 68, No. 20, p.1094-1107, Sep 2021, doi:10.1080/09500340.2021.1977404	
25	P. Singh, R. Kumar, A. K. Yadav, and K. Singh, "Security analysis and modified attack algorithms for a nonlinear optical cryptosystem based on DRPE," **Opt. Lasers Eng**., vol. 139, p. 106501, Apr. 2021, doi: 10.1016/j.optlaseng.2020.106501.	5.666 SCI/ SCOPUS
26	Archana, Sachin, and P. Singh, "Cascaded unequal modulus decomposition in Fresnel domain-based cryptosystem to enhance the image security," **Opt. Lasers Eng**., vol. 137, p. 106399, Feb. 2021, doi: 10.1016/j.optlaseng.2020.106399.	5.666 SCI/ SCOPUS
27	P. Rakheja, P. Singh, and R. Vig, "An asymmetric image encryption mechanism using QR decomposition in hybrid multi-resolution wavelet domain," **Opt. Lasers Eng**., vol. 134, p. 106177, Nov. 2020, doi: 10.1016/j.optlaseng.2020.106177.	5.666 SCI/ SCOPUS
28	P. Rakheja, R. Vig, and P. Singh, "Optical asymmetric watermarking using 4D hyperchaotic system and modified equal modulus decomposition in hybrid multi resolution wavelet domain," **Optik**, vol. 176, pp. 425–437, Jan. 2019, doi: 10.1016/j.ijleo.2018.09.088.	2.84 SCI/ SCOPUS
29	P. Rakheja, R. Vig, and P. Singh, "An asymmetric hybrid cryptosystem using hyperchaotic system and random decomposition in hybrid multi resolution wavelet domain," **Multimed. Tools Appl**., Mar. 2019, doi: 10.1007/s11042-019-7406-x.	2.577 SCI/ SCOPUS
30	P. Rakheja, R. Vig, and P. Singh, "Double image encryption using 3D Lorenz chaotic system, 2D non-separable linear canonical transform and QR decomposition," **Opt. Quantum Electron**., vol. 52, no. 2, p. 103, Feb. 2020, doi: 10.1007/s11082-020-2219-8.	2.794 SCI/ SCOPUS
31	Sachin, R. Kumar, P. Singh, "Unequal modulus decomposition and modified Gerchberg Saxton algorithm based asymmetric cryptosystem in Chirp-Z transform domain, **Optical and Quantum Electronics**, Vol 53, no. 5, 2021 https://doi.org/10.1007/s11082-021-02908-w	2.794 SCI/ SCOPUS
32	P. Rakheja, R. Vig, P. Singh, and R. Kumar, "An iris biometric protection scheme using 4D hyperchaotic system and modified equal modulus decomposition in hybrid multi resolution wavelet domain," **Opt. Quantum Electron.**, vol. 51, no. 6, p. 204, Jun. 2019, doi: 10.1007/s11082-019-1921-x.	2.794 SCI/ SCOPUS
33	P. Rakheja, R. Vig, and P. Singh, "An asymmetric hybrid cryptosystem using equal modulus and random decomposition in hybrid transform domain," **Opt. Quantum Electron**., vol. 51, no. 2, p. 54, Feb. 2019, doi: 10.1007/s11082-019-1769-0.	2.794 SCI/ SCOPUS
34	P. Rakheja, R. Vig, and P. Singh, "An asymmetric watermarking scheme based on random decomposition in hybrid multi-resolution wavelet domain using 3D Lorenz chaotic system," **Optik,** vol. 198, p. 163289, Dec. 2019, doi: 10.1016/j.ijleo.2019.163289.	2.84 SCI/ SCOPUS
35	P. Singh, A. K. Yadav, K. Singh, and I. Saini, "Asymmetric watermarking scheme in fractional Hartley domain using modified equal modulus decomposition," **J. Optoelectron. Adv. Mater**., vol. 21, no. 7–8, pp. 484–491, 2019.	0.5 SCI/ SCOPUS
36	P. Rakheja, P. Singh, R. Vig, and R. Kumar, "Double image encryption scheme for iris template protection using 3D Lorenz system and modified equal modulus decomposition in hybrid transform domain," **J. Mod. Opt**., vol. 67, no. 7, pp. 592–605, Apr. 2020, doi: 10.1080/09500340.2020.1760384.	1.293 SCI/ SCOPUS

37	A. K. Yadav, P. Singh, I. Saini, and K. Singh, “Asymmetric encryption algorithm for colour images based on fractional Hartley transform,” **J. Mod. Opt**., vol. 66, no. 6, pp. 629–642, Mar. 2019, doi: 10.1080/09500340.2018.1559951.	1.293 SCI/ SCOPUS
38	P. Rakheja, R. Vig, and P. Singh, “Asymmetric hybrid encryption scheme based on modified equal modulus decomposition in hybrid multi-resolution wavelet domain,” J**. Mod. Opt.**, vol. 66, no. 7, pp. 799–811, Apr. 2019, doi: 10.1080/09500340.2019.1574037.	1.293 SCI/ SCOPUS
39	P. Rakheja, R. Vig, and P. Singh, “An asymmetric hybrid watermarking mechanism using hyperchaotic system and random decomposition in 2D Non-separable linear canonical domain,” **Proc. Indian Natl. Sci. Acad**., Mar. 2019, doi: 10.16943/ptinsa/2019/49590.	1.291 SCI/ SCOPUS
40	P. Singh, A. K. Yadav, S. Yadav, and K. Singh, “Security-enhanced cryptosystem in fractional Hartley domain using double random phase encoding with nonlinear mask,” **Asian Journal of Physics**, vol. 30, no. 1, pp. 79–90, 2021.	
41	S. Bhatia, P. Sharma, P. Singh, and P. Bhatia, “Analyzing the impact of temperature on axoplasmic fluid properties defining neuronal excitation,” **J. Therm. Eng**., pp. 227–241, Mar. 2020, doi: 10.18186/thermal.710960.	SCOPUS
42	S. Dhar, P. Singh, J. Singh, A. K. Yadav, and S. Yadav, “Analysis of discharge patterns of subthalamic nucleus and external globus pallidus coupling in Parkinson condition using particle swarm optimization algorithm,” **Dyn. Contin. Discrete Impuls. Syst. Ser. B Appl. Algorithms**, vol. 28, pp. 25–40, 2021.	SCOPUS
43	S. Dhar, S. Yadav, P. Singh, J. Singh, and A. K. Yadav, “Optimization of discharge patterns in parkinson condition In subthalamic nucleus model of basal ganglia using Particle swarm optimization algorithm,” **Adv. Math. Sci. J.**, vol. 9, no. 5, pp. 3135–3153, Jul. 2020, doi: 10.37418/amsj.9.5.72.	SCOPUS
44	P. Rakheja, R. Vig, and P. Singh, “A hybrid multiresolution wavelet transform based encryption scheme,” **AIP Conf. Proc**., vol. 2061, p. 020008, 2019, doi: 10.1063/1.5086630.	SCOPUS
45	E. Kumari, S. Mukherjee, P. Singh, and R. Kumar, “Asymmetric color image encryption and compression based on discrete cosine transform in Fresnel domain,” **Results Opt**., vol. 1, p. 100005, Nov. 2020, doi: 10.1016/j.rio.2020.100005.	SCOPUS
46	E. Kumari, P. Singh, S. Mukherjee, and G. N. Purohit, “Analysis of triple random phase encoding cryptosystem in Fresnel domain,” **Results Opt**., vol. 1, p. 100009, Nov. 2020, doi: 10.1016/j.rio.2020.100009.	SCOPUS
47	V. Poply, P. Singh, and A. K. Yadav, “Analysis of stability and dual solution of MHD outer fluid velocity with partial slip on a stretching cylinder,” **Int. J. Adv. Trends Comput. Appl**., vol. Special Issue 1, no. 1, pp. 194–203, 2019.	SCOPUS
48	P. Singh, A. K. Yadav, S. Vashisth, and K. Singh, “Review of optical image encryption schemes based on fractional Hartley transform,” **Asian J. Phys**., vol. 28, no. 7–9, pp. 701–716, 2019.	

- **Research Publication in Book Chapter (Last Four years)**

Sr.	**Details of Chapter**
1	Sachin, Singh, P., Kumar, R., Yadav, A.K. (2022). Asymmetric Cryptosystem for Color Images Based on Unequal Modulus Decomposition in Chirp-Z Domain. In: Gupta, G., Wang, L., Yadav, A., Rana, P., Wang, Z. (eds) Proceedings of Academia-Industry

	Consortium for Data Science. Advances in Intelligent Systems and Computing, vol 1411. Springer, Singapore. https://doi.org/10.1007/978-981-16-6887-6_27
2.	S. Dhar, P. Singh, J. Singh and A. K. Yadav, "Optimization of discharge patterns in Parkinson condition in External Globus Pallidus model of Basal Ganglia Using particle Swarm optimization algorithm," in Proceedings of International Conference on Trends in Computational and Cognitive Engineering, Singapore, 2021, pp. 281–291, doi: 10.1007/978-981-15-5414-8_23.
3.	J. Kumar, P. Singh, and A. K. Yadav, "Asymmetric color image encryption using singular value decomposition and chaotic Tinkerbell map in fractional Fourier domain," in Optics and Photonics for Information Processing XIV, Online Only, United States, Aug. 2020, p. 10, doi: 10.1117/12.2568447.
4.	E. Kumari, P. Singh, S. Mukherjee, and G. N. Purohit, "Optical Chaotic Cryptosystem for Phase Images Using Random Amplitude and Phase Masks with Lorenz Map in Fresnel Domain," in Proceedings of International Conference on Trends in Computational and Cognitive Engineering, Singapore, 2021, pp. 1–13, doi: 10.1007/978-981-15-5414-8_1.
5.	Sachin, Archana, and P. Singh, "Optical Image Encryption Algorithm Based on Chaotic Tinker Bell Map with Random Phase Masks in Fourier Domain," in Proceedings of International Conference on Data Science and Applications, Singapore, 2021, pp. 249–262, doi: 10.1007/978-981-15-7561-7_20.
6.	J. Kumar, P. Singh, and A. K. Yadav, "Asymmetric color image encryption using singular value decomposition and chaotic Tinkerbell map in fractional Fourier domain," in Optics and Photonics for Information Processing XIV, Online Only, United States, Aug. 2020, p. 10, doi: 10.1117/12.2568447.
7.	S. Dhar, J. Singh, P. Singh, and A. K. Yadav, "Stability and Bifurcation Analysis of Delayed Neural Network Using Harmonic Balance Approach," in 2019 6th International Conference on Signal Processing and Integrated Networks (SPIN), Noida, India, Mar. 2019, pp. 1053–1057, doi: 10.1109/SPIN.2019.8711676.
8.	S. Dhar, P. Singh, J. Singh, and A. K. Yadav, "Optimization of discharge patterns in Parkinson condition in External Globus Pallidus model of Basal Ganglia Using particle Swarm optimization algorithm," in Proceedings of International Conference on Trends in Computational and Cognitive Engineering, Singapore, 2021, pp. 281–291, doi: 10.1007/978-981-15-5414-8_23.

- **Ph.D. Supervision: Nine Ph.D. students** Awarded Ph.D. degree

- **Edited Book:** 1. Phool Singh, R.K. Gupta, K. Ray, A. Bandyopadhyay, **Proceedings of International Conference on Trends in Computational and Cognitive Engineering**: TCCE 2019, Springer, October 2020.

  2. R.K. Gupta, R.K. Sharma, Phool Singh, AK Yadav and Kapil Kumar, **Frontiers in Industrial and Applied Mathematics — FIAM 2022,** AIP Conf. Proc. 3081, 010001 (2024) https://doi.org/10.1063/12.0024442

- **Conference Organized**: 2 days **International Conference on Frontiers in Industrial and Applied Mathematics — FIAM 2022**, December22-23, 2022 as **Convener,** and it is sponsored by DRDO and DST.

  3 days **International Conference on Trends in Computational and Cognitive Engineering**, November 28-30, 2019 as **Convener,** and it is sponsored by CSIR and DST

- **Award:** Awarded the **Best Researcher Award** for the year 2020 from SOET, CUH.

- **Project:** Completed a **DST sponsored Project under Cognitive Science Research Initiative (CSRI)** Scheme, entitled “A Computational model for STN (sub thalamic nucleus) in Parkinson Disease to investigate the discharge patterns” Sept 2015-Dec 2018, Amount Rs 15.58 Lakhs.

- Guided **Fifteen MSc Mathematics students** in their project in the department of Mathematics, CUH.

- Guiding **five Ph.D. students** in the Department of Mathematics, CUH.

- Resource Person at **various UGC-Human Resource Development Centres, International Conferences, national conferences, and workshops.**

Phool Singh